C
83
27

VOLUME 70 [W. B. No. 1871] NUMBER 8

UNITED STATES DEPARTMENT OF COMMERCE
Jesse H. Jones, *Secretary*
WEATHER BUREAU - - F. W. Reichelderfer, *Chief*

MONTHLY WEATHER REVIEW

AUGUST 1942

CONTENTS

	Page
Stream Lines of New England. (4 figs.)—V. Conrad	181
Meteorological and Climatological Data:	
Aerological Observations	186
River Stages and Floods	191
Climatological Data	193
Solar Radiation and Sunspot Data:	
Solar Radiation Observations	199
Positions, Areas, and Counts of Sunspots	200
Provisional Relative Sunspot Numbers	201
Charts I–XI. (Chart VII—Snowfall—omitted).	

For sale by the Superintendent of Documents, Washington, D. C. - - - - - - - - - See Page 4 of cover for prices

CORRECTIONS

Due to surface readings from a faulty barometer, all pressures in Table 1 for Detroit, Mich., for the months of July and August 1942 are 1.5 mbs. too low from the surface through 5 kilometers, and 1.0 mb. too low above 5 kilometers.

MONTHLY WEATHER REVIEW

Editor, EDGAR W. WOOLARD

VOL. 70, No. 8
W. B. No. 1371

AUGUST 1942

CLOSED OCTOBER 2, 1942
ISSUED NOVEMBER 2, 1942

STREAM LINES OF NEW ENGLAND

By V. CONRAD

[Harvard University, Cambridge, Mass., April 1942]

A rather strong correlation exists between the frequency of winds from a given direction and their average velocity; the more frequent the direction, the greater the average velocity—the strongest winds come mostly from the most frequent direction. The assumption can be made that the average velocity of the winds from a particular direction is approximately in linear proprotion to the frequency of the direction. Thus the resultant wind direction can be calculated from Lambert's formula in cases when only frequency statistics are published. These resultant directions for different stations may be plotted on a map in the usual way, and stream lines drawn in accordance with the principle that the wind arrows are tangent to these lines.

Stream lines represent the state of air motion at a particular moment, and must be carefully distinguished from *trajectories* or actual paths. *Climatological* stream lines derived from the *average* directions of the resultant winds for any particular epoch are analogous to arithmetical means. The more the variability of a quantity, the more fictitious the arithmetical mean; similarly for average resultant wind directions and average stream lines. In some tropical regions with a well-developed steady trade wind, stream lines give an actual picture of the air flow. A calculation of the persistence of the wind would be a desirable supplement to every representation of stream lines.

Frequency statistics of wind direction, at regular and cooperative stations of the U. S. Weather Bureau, were available for 19 New England stations for the five-year period, 1923–1927.[1] This number is rather small in comparison with the large area of New England, which amounts to 66,000 square miles; but for a preliminary study, without any attempt at an investigation of details, the material may be sufficient. The observations are exceedingly good, and stream lines may be drawn from them; but in drawing the individual curves, it is sometimes necessary to use personal judgment regarding the details. Physical considerations relating to the distribution of pressure are especially valuable for the interpolation of the trend of the stream lines. However, the main features as shown on the maps are undoubtedly correct, and give a good general indication of the average motion of the air during the given months. The mountain masses between stations undoubtedly have considerable influence; but, in the absence of observations, these effects are disregarded.

January.—The map which represents the stream lines for the month characteristic of winter shows a broad and powerful air current which originates from the interior of the continent and flows over New England. The direction is from *northwest* to *southeast*.[2] The trend of the stream lines is in good accord with the pressure distribution over North America.[3] The air current indicated by the lines is a portion of the great cyclonic circulation around the intense low pressure region south of Greenland.

July.—Also in midsummer a very uniform current exists, but it is now directed from *southwest* to *northeast*. The low pressure area shifts westwards from winter to summer, and lies in July close to the coast of North America in high latitudes. Therefore the trend of the isobars together with that of the stream lines is changed accordingly. The source region of the air masses in summer is either the interior of the continent or the tropical southwestern Atlantic Ocean.

Thus the stream lines indicate the most characteristic features of the climate of New England. On the average only continental or continentally-modified air masses flow over New England the year round, and cause the cold winters and warm summers—i. e., the *continental climate*.

On the average, the wind shifts clockwise only 55° from summer to winter so that it is not justifiable to speak of monsoon winds in this section.

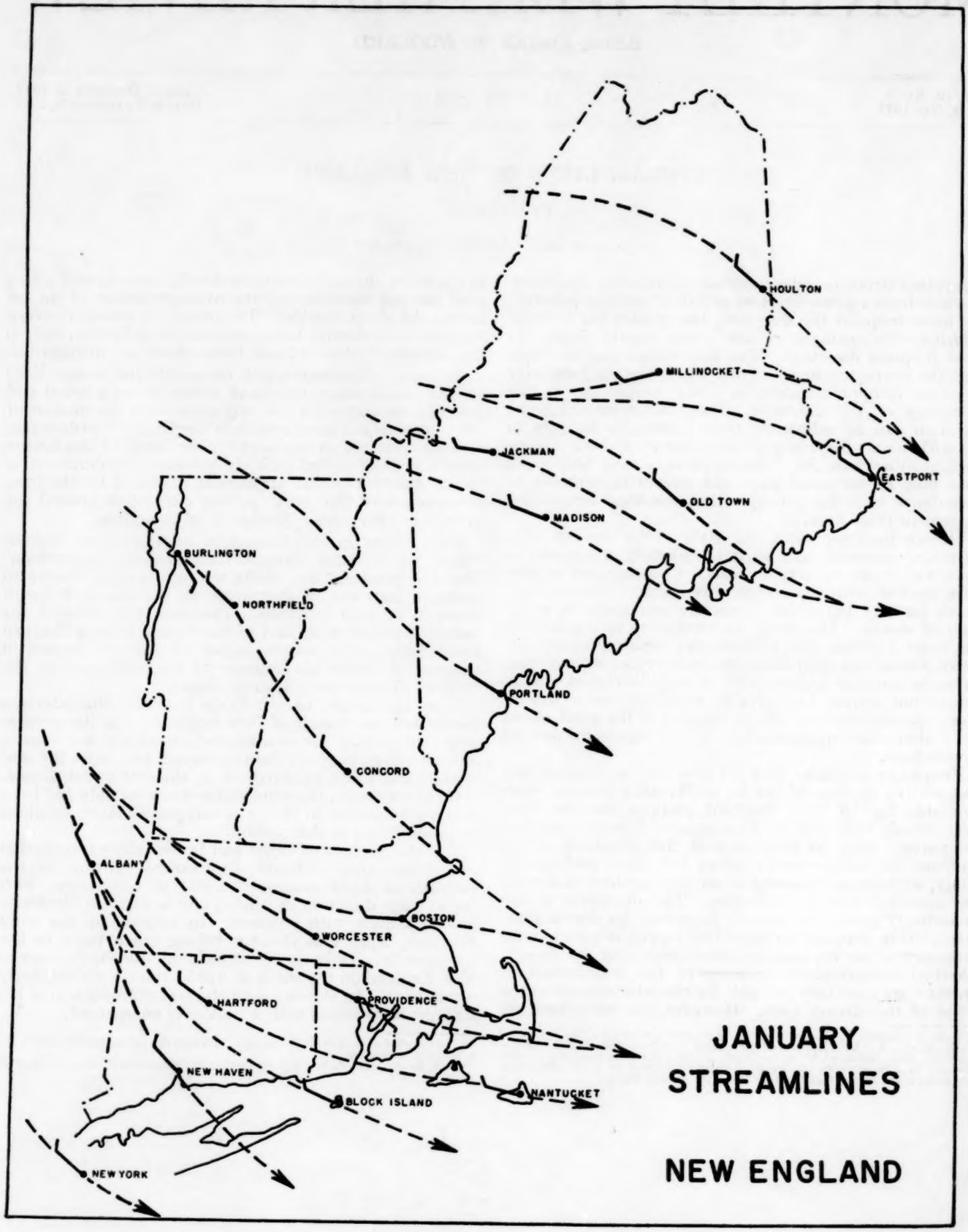
The stream lines of *April* and *October* show transitional conditions; they indicate an average shifting of the azimuth in April counterclockwise in comparison with the average direction in winter, and in October clockwise in comparison with summer. In respect to the wind direction, April and October belong much more to the winter type. Only on the islands off the south coast of New England do the winds in April have a weak southerly component. In October a much greater proportion of the stations have winds with a northerly component.

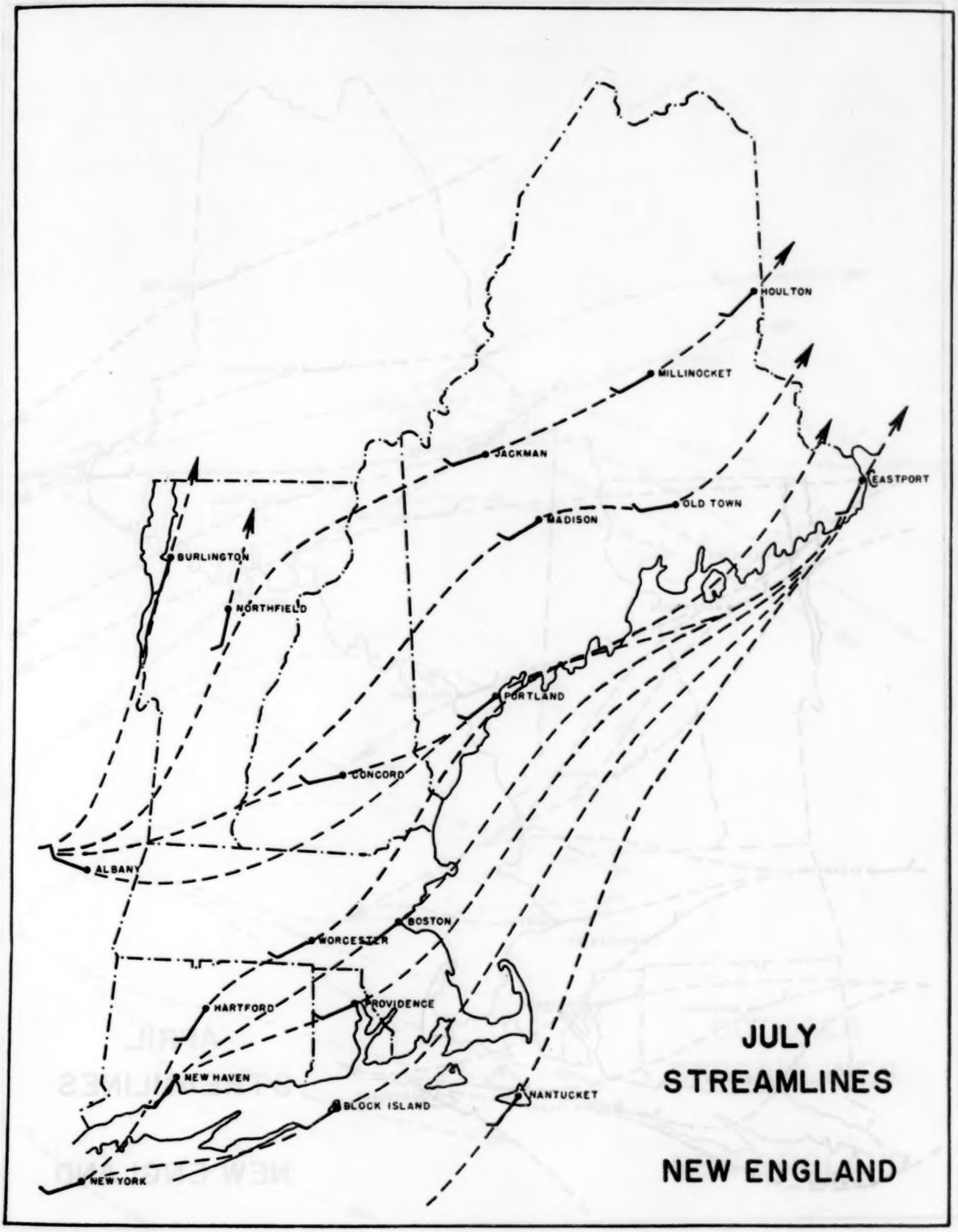
[1] Data for Concord, N. H., from R. DeC. Ward and C. F. Brooks, The Climate of North America, p. J 235, Köppen-Geiger *Handbuch der Klimatologie*, Berlin, 1936; for Worcester, Mass., tabulated by Myrtle Cash; for the cooperative stations in Maine tabulated by Edward Sable, and for other stations tabulated by K. G. McCasland from tables in the Annual Report of the Chief of the Weather Bureau.

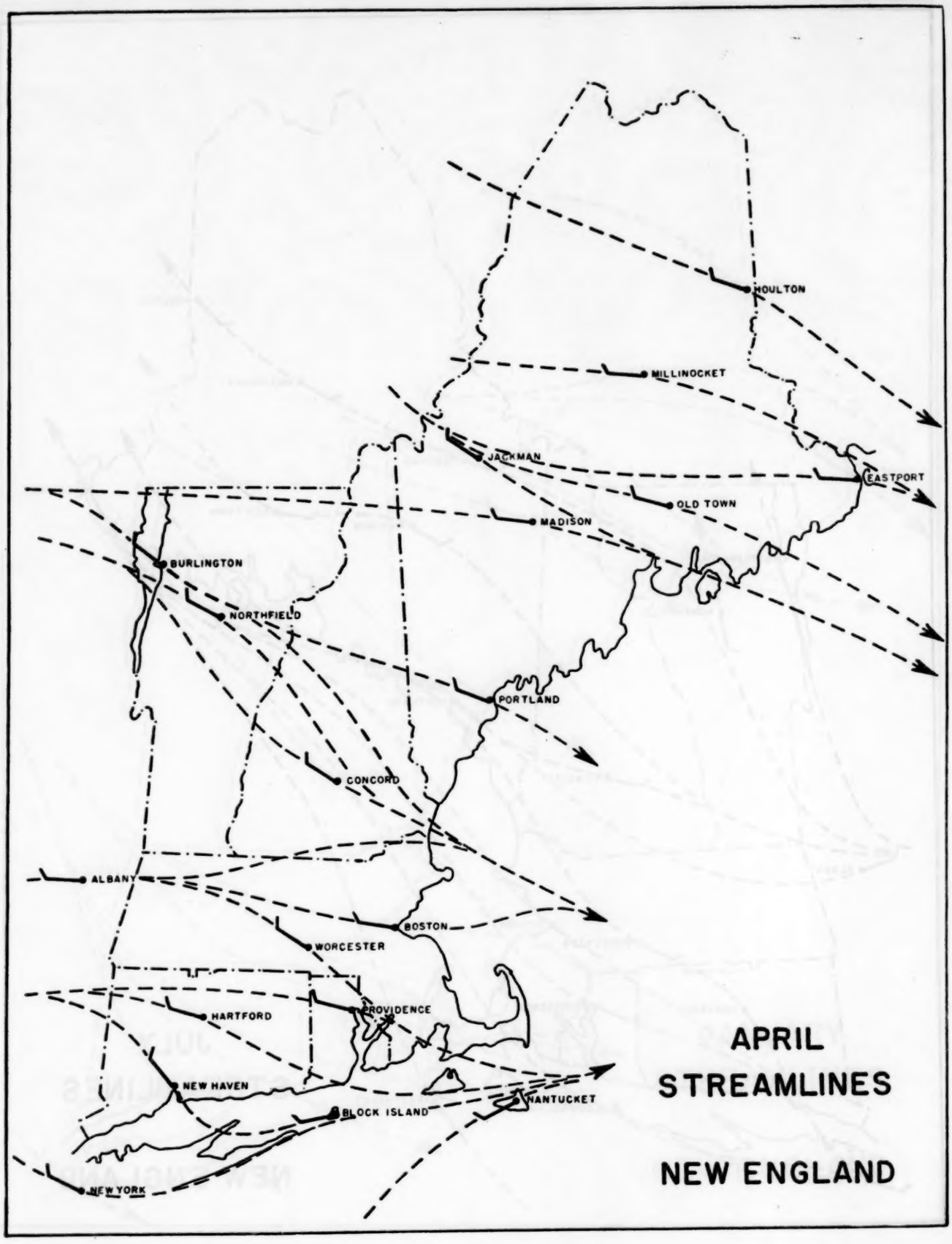
[2] The SE wind at Burlington, Vt. seems to be a local downslope, land-lake wind, and so has been disregarded.

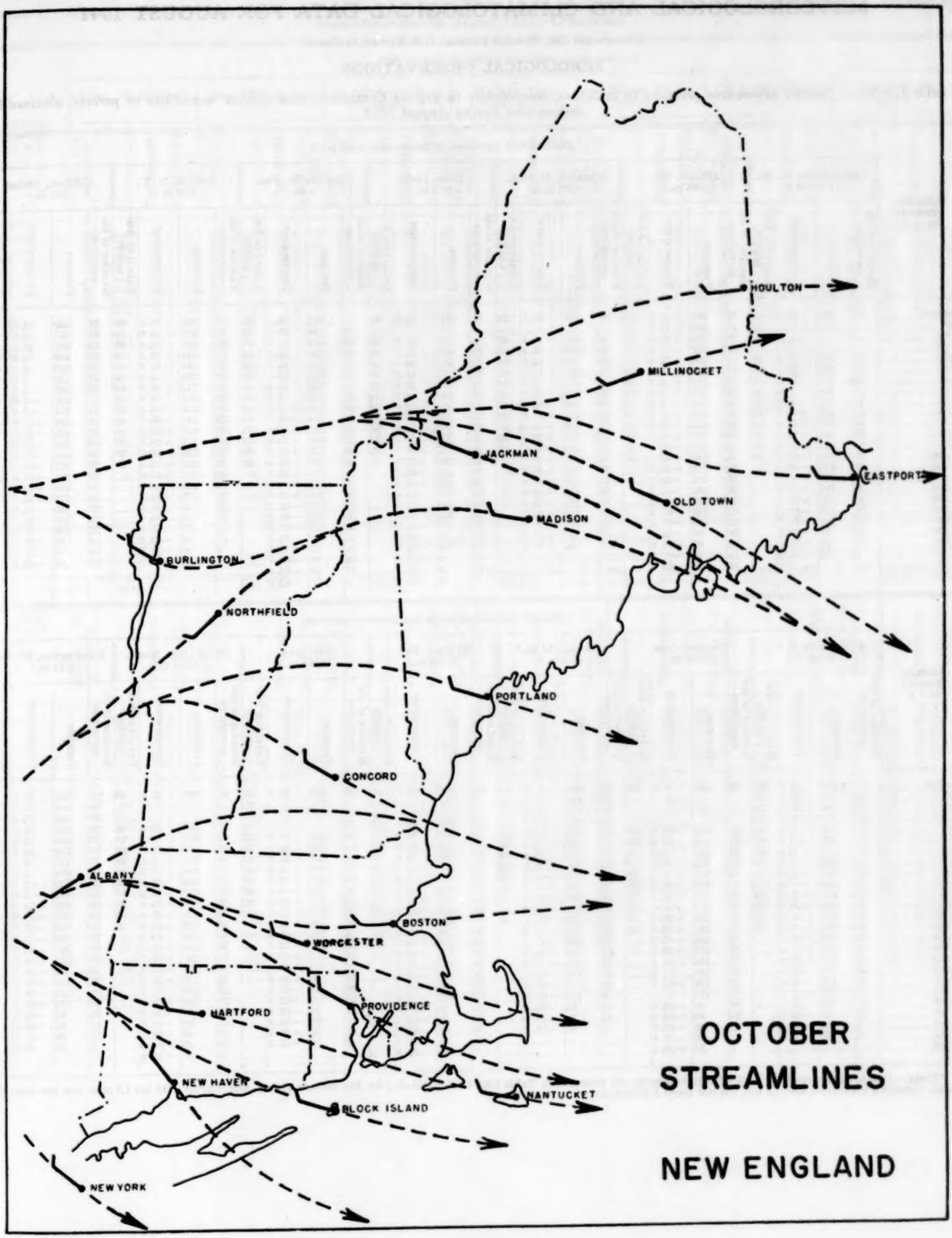
[3] C. F. Brooks, A. J. Conner, and others, Climatic Maps of North America, Harvard University, 1936.

485806—42—1


HOULTON
MILLINOCKET
JACKMAN
EASTPORT
OLD TOWN
MADISON
BURLINGTON
NORTHFIELD
PORTLAND
CONCORD
ALBANY
BOSTON
WORCESTER
HARTFORD
PROVIDENCE
NEW HAVEN
NANTUCKET
BLOCK ISLAND
NEW YORK
JANUARY
STREAMLINES
NEW ENGLAND


HOULTON
MILLINOCKET
JACKMAN
EASTPORT
OLD TOWN
MADISON
BURLINGTON
NORTHFIELD
PORTLAND
CONCORD
ALBANY
BOSTON
WORCESTER
HARTFORD
PROVIDENCE
NEW HAVEN
NANTUCKET
BLOCK ISLAND
NEW YORK
JULY
STREAMLINES
NEW ENGLAND


HOULTON
MILLINOCKET
JACKMAN
EASTPORT
OLD TOWN
MADISON
BURLINGTON
NORTHFIELD
PORTLAND
CONCORD
ALBAN
BOSTON
WORCESTER
PROVIDENCE
HARTFORD
NEW HAVEN
NANTUCKET
BLOCK ISLAND
NEW YORK
APRIL
STREAMLINES
NEW ENGLAND


HOULTON
MILLINOCKET
JACKMAN
EASTPORT
OLD TOWN
MADISON
BURLINGTON
NORTHFIELD
PORTLAND
CONCORD
ALBANY
BOSTON
WORCESTER
HARTFORD
PROVIDENCE
NEW HAVEN
NANTUCKET
BLOCK ISLAND
NEW YORK
OCTOBER
STREAMLINES
NEW ENGLAND

METEOROLOGICAL AND CLIMATOLOGICAL DATA FOR AUGUST 1942

[Climate and Crop Weather Division, J. B. KINCER, in charge]

AEROLOGICAL OBSERVATIONS

TABLE 1.—*Mean free-air barometric pressure in millibars, temperature in degrees Centigrade, and relative humidities in percent, obtained by radiosondes during August 1942*

Stations and elevations in meters above sea level

Altitude (meters) m. s. l.	Albuquerque, N. M. (1,620 m.)				Atlanta, Ga. (298 m.)				Bismarck, N. Dak. (505 m.)				Boise, Idaho (873 m.)				Brownsville, Tex. (6 m.)				Buffalo, N. Y. (221 m.)				Caribou, Maine (191 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	31	839	23.3	49	31	984	22.3	87	30	954	18.7	75	31	913	23.9	34	30	1,012	26.4	87	31	992	18.2	80	31	992	14.6	84
500					31	962	22.7	76									30	958	23.9	82	31	960	19.0	71	31	957	16.4	73
1,000					31	908	20.5	75	30	901	19.4	65	31	899	25.9	33	30	904	21.5	70	31	906	16.4	66	31	903	13.8	67
1,500					31	857	17.4	78	30	850	17.1	65	31	849	24.3	30	30	854	19.0	65	31	854	13.3	70	31	850	10.8	67
2,000	31	803	21.9	48	31	808	14.7	74	29	801	14.3	62	31	801	20.5	29	30	805	16.5	56	31	804	11.0	62	31	800	8.1	66
2,500	31	758	18.5	48	31	761	12.2	69	29	755	11.1	61	31	756	16.4	30	30	759	13.8	53	31	758	8.5	56	31	753	5.8	63
3,000	31	715	15.0	51	31	717	9.4	66	29	711	7.8	56	31	712	12.4	30	30	715	11.1	49	31	713	6.3	52	31	708	3.5	57
4,000	31	634	7.0	63	31	635	4.2	61	29	629	1.7	50	31	631	4.7	32	30	634	5.7	45	31	631	1.5	46	31	626	−1.8	53
5,000	31	561	−0.2	76	31	561	−1.1	58	28	555	−4.5	43	31	558	−2.6	34	29	560	0.2	45	31	556	−4.1	42	31	551	−7.4	48
6,000	31	495	−6.4	79	30	495	−6.7	52	28	488	−11.0	35	31	491	−9.8	34	28	494	−5.7	44	29	489	−10.5	42	31	484	−13.9	43
7,000	30	435	−12.2	74	30	435	−12.6	49	27	428	−18.0	31	31	430	−17.2	34	28	434	−11.8	41	28	429	−17.2	40	31	424	−20.9	42
8,000	30	381	−18.7	68	30	380	−19.5	47	26	373	−25.2	29	30	376	−24.3	33	27	380	−18.6	38	27	375	−24.2	39	31	369	−28.1	39
9,000	29	332	−25.4	62	28	332	−26.6	45	25	324	−32.7	29	29	327	−31.7	32	26	332	−25.5	36	27	326	−30.6	39	30	320	−35.3	38
10,000	28	289	−32.8	58	26	289	−34.1	43	24	281	−40.1	----	28	284	−39.1	32	26	288	−33.0	36	26	283	−37.3	37	29	277	−41.7	----
11,000	24	250	−40.6	----	26	249	−41.9	----	23	242	−46.2	----	28	244	−45.3	----	26	250	−40.7	----	26	244	−44.6	----	28	238	−47.3	----
12,000	24	216	−48.2	----	26	215	−49.3	----	23	208	−50.8	----	26	210	−49.6	----	25	215	−48.5	----	24	210	−50.6	----	28	204	−51.3	----
13,000	24	185	−56.0	----	26	184	−56.3	----	23	178	−53.3	----	23	180	−53.4	----	25	184	−55.9	----	21	179	−54.1	----	28	175	−53.7	----
14,000	23	157	−63.3	----	26	157	−62.2	----	20	152	−55.1	----	23	154	−56.9	----	25	157	−63.2	----	19	153	−57.5	----	27	150	−55.5	----
15,000	21	133	−69.2	----	25	133	−65.9	----	14	130	−56.7	----	22	132	−59.4	----	25	133	−69.9	----	19	130	−59.9	----	25	128	−57.5	----
16,000	16	113	−71.7	----	24	113	−67.3	----	13	111	−57.5	----	22	112	−60.9	----	25	112	−73.9	----	16	111	−61.2	----	22	109	−57.9	----
17,000	14	95	−69.6	----	24	96	−66.6	----	11	95	−56.4	----	21	95	−60.8	----	22	94	−74.5	----	12	94	−60.0	----	19	93	−57.1	----
18,000	11	80	−66.4	----	24	81	−64.9	----	8	81	−55.2	----	19	81	−59.9	----	21	79	−72.5	----	9	80	−58.8	----	16	79	−55.1	----
19,000	7	68	−63.9	----	21	69	−62.1	----					16	69	−58.5	----	19	66	−68.7	----	7	68	−57.1	----	12	68	−53.6	----
20,000					17	59	−59.9	----					13	59	−56.6	----	11	56	−65.4	----								
21,000													7	50	−54.9	----	6	47	−62.0	----								

Stations and elevations in meters above sea level

Altitude (meters) m. l. s.	Charleston, S. C. (14 m.)				Denver, Colo. (1,616 m.)				Detroit, Mich.* (217 m.)				El Paso, Tex. (1,193 m.)				Ely, Nev. (1,908 m.)				Great Falls, Mont. (1,128 m.)				Huntington, W. Va. (172 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	31	1,017	24.0	91	31	840	19.9	54	31	990	17.8	91	31	882	24.7	61	30	810	19.1	33	31	888	19.8	45	30	997	20.4	92
500	31	962	22.9	76					31	958	19.3	75													30	960	21.6	74
1,000	31	908	20.2	71					31	904	16.7	73													30	906	19.1	70
1,500	31	857	17.2	68					31	852	13.7	71	31	851	24.3	55					31	850	19.2	46	30	855	15.8	74
2,000	31	808	14.6	64	31	803	20.0	49	31	803	11.4	60	31	804	20.9	54	30	802	20.5	33	31	801	15.5	46	30	806	12.9	69
2,500	31	762	12.0	62	31	757	17.0	48	31	756	9.3	52	31	758	17.0	60	30	756	19.5	31	31	755	11.7	50	30	759	10.7	58
3,000	31	717	9.2	61	31	714	13.4	50	30	711	6.9	48	31	715	13.0	69	30	713	15.6	31	31	711	8.0	54	30	715	8.2	54
4,000	31	635	3.9	56	31	633	6.0	55	30	630	2.0	42	31	634	6.1	76	30	633	6.9	35	31	630	1.2	59	30	632	2.9	54
5,000	30	561	−1.6	55	31	560	−1.5	62	30	556	−3.9	42	31	561	−0.3	75	29	560	−1.6	43	31	556	−5.1	56	29	558	−2.2	46
6,000	29	494	−7.5	50	31	493	−8.4	63	29	489	−10.3	41	30	494	−6.2	71	29	493	−9.2	46	31	488	−12.2	54	29	492	−8.0	41
7,000	29	434	−13.6	46	30	432	−15.1	57	28	429	−17.1	41	30	435	−11.7	64	28	432	−16.0	46	30	428	−19.4	51	29	432	−14.3	40
8,000	25	380	−20.2	44	30	378	−22.0	53	27	374	−24.2	39	29	380	−17.9	59	27	378	−22.6	44	30	373	−26.9	50	29	378	−20.9	39
9,000	23	331	−27.5	40	30	329	−29.3	51	26	325	−31.6	38	29	332	−24.5	56	26	329	−29.9	41	30	323	−34.4	48	29	329	−28.0	38
10,000	23	287	−35.2	41	29	286	−36.8	48	26	282	−39.4	----	29	289	−31.9	54	25	286	−36.8	39	30	280	−42.1	----	29	286	−35.4	37
11,000	22	249	−42.7	----	29	246	−43.9	----	24	243	−47.2	----	29	250	−39.7	----	25	247	−42.6	----	30	241	−48.3	----	29	247	−43.0	----
12,000	22	214	−50.0	----	29	212	−50.5	----	24	208	−52.9	----	29	216	−47.7	----	25	213	−47.8	----	30	207	−51.7	----	29	213	−50.0	----
13,000	22	183	−56.8	----	29	182	−56.4	----	23	178	−57.4	----	28	185	−55.7	----	24	182	−53.7	----	29	177	−53.7	----	28	182	−56.2	----
14,000	22	156	−62.8	----	27	154	−61.9	----	23	152	−60.4	----	28	157	−63.6	----	23	156	−58.7	----	29	152	−55.3	----	28	155	−61.4	----
15,000	21	132	−66.4	----	27	131	−65.7	----	22	129	−63.7	----	28	133	−70.3	----	22	133	−61.8	----	28	129	−57.1	----	26	132	−64.8	----
16,000	19	112	−67.3	----	27	112	−67.1	----	18	110	−64.7	----	27	112	−73.4	----	22	113	−62.9	----	28	110	−58.3	----	23	112	−66.2	----
17,000	16	95	−66.3	----	27	94	−66.0	----	15	93	−63.6	----	23	94	−71.5	----	22	96	−62.1	----	27	94	−58.2	----	20	95	−66.0	----
18,000	15	80	−63.7	----	26	80	−63.6	----	12	79	−61.0	----	20	80	−69.2	----	19	82	−59.8	----	25	80	−57.0	----	17	81	−64.0	----
19-000	9	68	−62.1	----	23	68	−60.8	----	5	67	−58.2	----	18	68	−65.7	----	15	70	−57.4	----	22	69	−55.5	----	11	68	−61.1	----
20,000	6	52	−60.8	----	11	58	−58.4	----					13	58	−62.0	----	6	59	−55.3	----	15	58	−54.0	----	6	58	−58.6	----
21,000					6	50	−56.1	----					7	49	−59.5	----					5	50	−52.4	----				

*NOTE.—Due to surface readings from a faulty barometer, all pressures in Table 1 for Detroit, Mich., for the months of July and August 1942 are 1.5 mbs. too low from the surface through 5 kilometers, and 1.0 mb. too low above 5 kilometers.

TABLE 1.—*Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in percent, obtained by radiosondes during August 1942*—Continued

Attitude (meters) m. s. l.	Joliet, Ill. (178 m.)				Lake Charles, La. (5 m.)				(1) Lakehurst, N. J. (39 m.)				Medford, Oreg. (401 m.)				Miami, Fla. (4 m.)				Nashville, Tenn. (180 m.)				(1) Norfolk, Va. (4 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	31	995	19.4	87	31	1014	25.8	90	27	1,012	20.5	86	31	965	26.1	37	31	1,017	25.9	87	31	996	22.8	86	28	1,019	23.8	82
500	31	959	21.0	74	31	959	24.5	79	27	960	20.9	68	31	954	26.2	37	31	962	24.4	85	31	960	22.9	74	28	963	22.1	77
1,000	31	905	18.1	73	31	906	22.0	71	27	907	18.4	65	31	901	23.2	38	31	908	21.4	81	31	907	20.1	72	28	910	19.3	75
1,500	31	854	15.0	73	31	856	19.5	63	27	855	15.4	62	31	851	19.6	41	31	858	18.6	73	31	856	17.1	73	28	858	16.9	70
2,000	31	804	12.8	64	31	807	16.9	59	27	806	12.9	57	31	802	15.8	47	31	809	15.7	66	31	807	14.5	70	28	809	14.6	69
2,500	31	758	11.0	57	31	760	14.1	55	27	759	10.6	49	31	756	12.7	52	31	762	12.9	61	31	760	11.8	67	28	763	11.9	68
3,000	31	714	8.5	54	31	717	11.1	55	27	715	8.2	46	31	712	10.0	49	31	718	9.9	58	31	716	9.1	65	28	719	9.4	65
4,000	30	632	3.1	49	31	635	5.4	55	27	632	3.0	42	30	631	3.9	42	31	636	4.1	55	31	634	3.8	60	28	636	3.6	61
5,000	30	558	−2.4	45	31	562	−.2	59	27	558	−2.7	40	30	557	−2.6	39	31	562	−1.6	58	28	560	−1.5	53	27	562	−2.2	57
6,000	30	491	−8.8	41	31	495	−5.8	59	26	491	−9.1	40	29	491	−9.4	37	30	495	−7.4	56	28	493	−7.1	47	27	494	−8.1	54
7,000	30	431	−15.5	41	31	435	−12.0	56	25	431	−15.4	41	29	431	−16.6	35	29	435	−13.5	53	28	434	−13.3	44	27	434	−14.5	55
8,000	29	377	−22.5	41	31	381	−18.7	53	24	376	−22.1	48	25	376	−24.4	34	29	381	−20.0	50	27	379	−20.2	42				
9,000	29	328	−29.6	40	31	333	−25.5	51	24	328	−29.1	49	25	326	−31.7	33	29	332	−26.8	48	27	330	−27.0	40				
10,000	29	285	−36.9	39	31	289	−32.8	49	24	285	−36.4		25	283	−38.6	32	28	288	−34.1	47	26	288	−34.4	40				
11,000	27	246	−44.3		31	251	−40.7		21	246	−43.7		24	244	−45.1		24	250	−41.9		26	249	−42.1					
12,000	27	212	−50.7		30	216	−48.7		19	211	−50.5		21	210	−49.5		19	215	−49.6		26	214	−49.7					
13,000	27	181	−55.3		29	185	−56.8		18	182	−56.2		21	180	−53.4		18	184	−57.1		25	183	−56.9					
14,000	27	154	−59.2		29	157	−64.4		18	155	−60.3		21	154	−56.6		18	157	−63.9		25	156	−63.0					
15,000	25	132	−62.5		28	133	−70.0		16	132	−62.6		21	131	−59.1		18	133	−68.0		25	133	−66.3					
16,000	25	112	−64.4		28	113	−73.3		15	112	−62.9		21	112	−60.7		16	113	−69.8		25	112	−68.0					
17,000	24	95	−63.8		25	95	−72.8		9	95	−62.8		19	95	−61.3		15	95	−69.2		20	95	−67.3					
18,000	19	81	−61.8		24	80	−70.0		7	81	−63.2		18	81	−60.3		12	80	−67.0		20	80	−64.8					
19,000	12	69	−59.3		20	68	−67.5						18	69	−58.6		8	68	−63.6		15	68	−62.2					
20,000					16	57	−64.4						13	58	−56.6						11	58	−59.9					
21,000					5	48	−61.3						9	50	−54.8													
22,000													5	43	−53.7													

Altitude (meters) m. s. l.	Oakland, Calif. (6 m.)				Oklahoma City, Okla. (391 m.)				Omaha, Nebr. (301 m.)				(1) Pensacola, Fla. (24 m.)				Phoenix, Ariz. (339 m.)				Portland, Maine (20 m.)				St. Louis, Mo. (171 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	31	1012	15.9	82	31	969	24.3	79	31	980	22.3	79	17	1015	27.4	78	30	969	30.8	42	31	1014	15.8	88	31	996	22.7	78
500	31	956	17.9	64	31	958	25.3	76	31	958	23.2	68	17	961	24.4	73	30	952	32.3	37	31	959	18.3	68	31	959	23.0	66
1,000	31	902	22.6	32	31	905	23.7	68	31	904	21.7	63	17	908	21.5	66	30	900	30.0	34	31	905	15.3	71	31	906	19.9	67
1,500	31	851	21.8	25	31	854	20.7	69	31	854	18.7	63	17	857	18.8	61	30	851	26.7	35	31	853	12.3	70	31	855	16.9	68
2,000	31	803	19.3	22	31	806	17.6	67	31	804	15.9	61	17	808	15.9	58	30	803	22.7	39	31	803	9.6	67	31	806	14.4	60
2,500	31	757	16.2	22	31	760	14.5	66	30	759	13.2	56	17	762	13.4	55	30	758	18.7	45	31	756	7.0	60	31	759	11.9	56
3,000	31	714	12.9	22	31	716	11.7	63	30	715	10.3	55	16	718	10.9	50	30	715	14.8	50	31	711	4.8	53	31	715	9.3	53
4,000	31	633	6.6	24	31	635	5.7	58	30	633	4.4	53	16	636	5.4	48	30	634	7.4	56	31	629	−0.2	48	31	634	4.0	50
5,000	31	560	−0.2	26	30	562	0.1	52	30	560	−1.6	49	15	563	−0.4	46	29	561	0.7	60	29	554	−5.8	39	29	560	−1.5	46
6,000	31	494	−7.2	26	30	495	−5.7	48	30	493	−7.8	44	12	495	−5.9	45	28	495	−5.5	56	29	487	−12.3	32	29	493	−7.5	44
7,000	31	433	−14.4	23	27	435	−12.1	45	29	433	−14.7	42	11	436	−11.7	44	28	435	−11.4	51	27	427	−19.1	31	29	433	−14.2	42
8,000	30	378	−21.9	22	27	381	−18.9	44	29	378	−21.9	40	11	382	−18.4	43	28	381	−18.5	48	27	372	−25.9	31	28	378	−21.1	40
9,000	30	329	−29.3	21	26	332	−25.7	43	29	329	−29.1	38	11	333	−25.5	49	28	332	−26.0	46	26	323	−33.4	30	27	330	−28.0	39
10,000	30	286	−36.8	20	25	289	−32.9	42	29	286	−36.2	35	9	290	−32.7		27	280	−33.7	45	24	280	−40.8		27	286	−35.2	37
11,000	30	247	−43.2		24	250	−40.5		29	247	−43.5		9	252	−40.3		26	250	−41.3		22	241	−47.0		27	248	−42.5	
12,000	29	213	−48.9		21	216	−48.1		29	212	−50.0		7	217	−48.6		25	216	−48.9		18	207	−51.9		26	213	−49.4	
13,000	29	182	−54.5		21	185	−55.5		29	182	−55.3						23	185	−56.5		16	177	−55.0		26	183	−55.6	
14,000	29	156	−59.6		21	157	−62.6		29	155	−59.4						21	157	−63.3		10	152	−56.7		26	156	−60.7	
15,000	29	132	−63.5		21	134	−68.3		29	132	−62.1						20	134	−68.7		8	129	−58.6		25	132	−64.7	
16,000	29	113	−65.2		21	113	−71.1		25	112	−63.5						19	113	−70.9						25	112	−66.5	
17,000	28	95	−64.4		18	95	−70.8		23	95	−63.5						17	95	−69.3						21	95	−65.9	
18,000	23	81	−62.4		18	80	−67.8		19	81	−62.2						12	80	−67.1						19	81	−63.7	
19,000	18	69	−60.2		15	68	−64.6		7	69	−60.0						6	68	−63.9						10	69	−61.2	
20,000	10	58	−57.9		12	58	−61.7																		8	58	−58.8	
21,000	6	50	−55.6		8	49	−58.2																					

TABLE 1.—*Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in percent, obtained by radiosondes during August 1942*—Continued

Altitude (meters) m. s. l.	St. Paul, Minn (225 m.)				San Antonio, Tex. (242 m.)				San Diego, Calif. (19 m.)				S. S. Marie, Mich. (221 m.)				(1) Seattle, Wash (27 m.)				Spokane, Wash. (598 m.)				Washington, D. C. (25 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	31	988	20.3	81	29	987	26.6	74	28	1,008	19.1	83	30	990	15.5	84	30	1012	20.6	69	31	943	22.8	40	30	1,016	22.0	85
500	31	957	20.4	74	29	959	25.3	76	28	954	20.6	62	30	958	16.6	72	30	958	18.8	62					30	962	21.1	77
1,000	31	903	17.9	72	29	906	22.7	77	28	902	23.6	33	30	903	14.6	68	30	904	16.6	56	31	900	23.1	38	30	908	18.2	76
1,500	31	852	15.2	72	29	855	20.2	76	28	852	23.1	24	30	851	11.8	70	30	852	14.2	54	31	850	19.3	38	30	856	15.4	74
2,000	31	802	12.7	65	29	807	17.4	70	28	804	20.6	26	30	802	9.3	66	30	803	11.5	53	31	801	15.2	41	30	806	13.0	67
2,500	31	756	10.1	62	29	761	14.8	63	28	758	17.3	33	30	754	7.3	59	30	756	8.3	54	31	755	11.2	43	30	760	10.8	65
3,000	31	712	7.6	57	29	717	12.3	59	28	715	13.7	35	30	710	5.0	55	30	711	5.8	46	31	711	7.8	45	30	716	8.5	62
4,000	30	630	2.1	53	29	636	6.5	59	28	634	7.1	39	29	627	−0.4	48	30	629	0.1	36	30	628	1.4	46	29	634	3.2	59
5,000	30	556	−3.8	49	29	562	0.8	59	28	560	0.6	38	27	553	−6.1	41	30	554	−6.3	32	30	555	−5.1	47	29	560	−2.4	55
6,000	29	489	−10.0	44	29	496	−4.9	55	27	493	−6.1	30	27	486	−12.7	36	30	487	−13.4	33	30	487	−12.0	45	29	493	−8.0	48
7,000	29	429	−16.7	42	29	436	−11.0	52	27	433	−12.6	29	27	425	−19.7	33	29	426	−20.8	34	30	427	−19.2	43	28	433	−14.4	45
8,000	29	374	−23.9	39	28	382	−16.8	52	16	381	−20.0	----	24	370	−26.8	32	29	371	−28.3	40	29	372	−26.5	42	26	378	−21.2	45
9,000	29	326	−31.2	37	28	333	−23.9	51	16	331	−27.7	----	23	322	−34.1	30	28	322	−35.5	43	29	323	−33.7	42	24	329	−28.3	44
10,000	27	282	−38.4	35	28	290	−31.2	49	16	288	−35.1	----	20	278	−41.1	----	27	279	−42.7	----	29	280	−40.9	----	23	286	−35.1	44
11,000	25	244	−45.4	----	28	251	−39.2	48	16	249	−42.2	----	18	240	−47.2	----	25	240	−49.6	----	29	241	−47.0	----	22	247	−42.2	----
12,000	24	209	−50.8	----	25	216	−47.3	----	16	215	−49.3	----	17	206	−51.7	----	25	205	−53.8	----	28	207	−50.8	----	22	213	−49.1	----
13,000	24	179	−54.2	----	25	186	−55.4	----	13	184	−56.2	----	15	176	−52.6	----	23	176	−55.8	----	28	177	−52.9	----	20	182	−54.9	----
14,000	23	153	−56.3	----	25	158	−62.7	----	12	157	−62.8	----	11	150	−54.7	----	21	149	−57.8	----	28	151	−54.7	----	20	156	−59.7	----
15,000	21	131	−58.3	----	25	134	−68.0	----	9	133	−67.6	----	10	128	−57.2	----	15	127	−59.3	----	27	130	−56.3	----	17	132	−63.1	----
16,000	20	112	−59.2	----	22	113	−72.2	----	9	113	−70.4	----	9	109	−58.4	----	12	108	−59.7	----	25	111	−57.3	----	15	112	−64.5	----
17,000	15	95	−58.9	----	21	95	−71.9	----	5	96	−70.0	----	6	93	−57.1	----	8	91	−58.9	----	23	94	−57.6	----	15	95	−64.5	----
18,000	13	81	−57.5	----	18	80	−68.4	----	----	----	----	----	----	----	----	----	5	77	−57.8	----	21	80	−57.1	----	13	80	−63.3	----
19,000	11	70	−55.9	----	16	68	−64.4	----	----	----	----	----	----	----	----	----	----	----	----	----	19	68	−56.2	----	12	68	−60.8	----
20,000	5	60	−54.2	----	13	58	−60.5	----	----	----	----	----	----	----	----	----	----	----	----	----	15	58	−55.0	----	9	58	−58.3	----
21,000	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	6	50	−53.2	----	----	----	----	----

Altitude (meters) m. s. l.	Anchorage, Alaska (42 m.)				Bethel, Alaska (7 m.)				Fairbanks, Alaska (156 m.)				Juneau, Alaska (49 m.)				Ketchikan, Alaska (26 m.)				Nome, Alaska (14 m.)				San Juan, P. R. (15 m.)				Swan Island, W. I. (10 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	31	1,006	15.5	72	22	1,009	13.7	81	31	990	16.8	62	31	1,011	15.5	77	31	1,015	17.0	75	19	1,003	12.5	79	28	1,014	26.5	84	28	1,012	26.8	86
500	31	952	12.6	72	22	952	10.2	87	31	951	14.0	64	31	959	13.0	79	31	960	14.3	77	19	947	10.5	82	28	960	23.6	90	28	957	22.9	90
1,000	31	897	9.1	75	22	896	6.9	90	31	896	10.1	67	31	903	9.9	85	31	904	11.0	80	19	892	7.4	85	28	907	20.5	89	28	904	19.8	86
1,500	31	844	5.9	82	22	843	4.5	89	31	843	6.4	71	30	850	6.9	88	31	852	8.4	78	19	839	4.7	84	28	856	17.9	85	28	853	16.9	81
2,000	31	794	2.5	85	22	792	2.4	84	31	793	2.9	76	30	800	4.2	87	31	801	6.5	72	19	789	2.1	83	28	807	15.2	77	28	804	14.1	77
2,500	30	746	−0.3	83	22	744	0.2	77	31	745	−0.3	81	30	752	2.1	77	31	754	3.9	69	19	741	−0.6	84	28	761	12.9	68	28	758	11.7	73
3,000	30	701	−2.9	81	22	699	−2.0	71	31	700	−3.4	81	28	706	−0.1	68	31	709	1.5	65	19	696	−3.3	84	28	717	10.3	58	28	714	9.0	70
4,000	28	617	−8.8	79	22	616	−6.6	70	31	616	−9.1	76	26	623	−5.0	59	31	625	−3.9	61	19	613	−8.8	73	28	635	4.5	53	26	632	3.2	67
5,000	28	542	−14.3	76	22	542	−12.6	71	30	541	−15.2	74	23	548	−10.9	53	30	550	−9.8	59	19	538	−15.1	69	27	561	−0.8	47	26	559	−2.6	67
6,000	28	474	−20.5	74	22	474	−19.0	66	30	473	−22.1	71	21	480	−17.4	52	28	482	−16.1	57	18	470	−21.7	65	26	494	−6.4	48	26	492	−8.5	68
7,000	28	413	−27.0	71	22	414	−25.6	63	29	412	−29.1	68	20	420	−24.4	51	26	422	−22.9	55	18	410	−28.5	62	26	435	−12.8	48	26	432	−14.6	67
8,000	28	359	−34.0	69	22	360	−32.1	61	29	357	−36.4	66	19	365	−31.6	51	22	367	−29.9	54	15	356	−35.7	61	23	380	−19.9	47	26	378	−21.3	64
9,000	28	310	−41.3	----	22	311	−39.2	----	29	308	−43.6	----	19	316	−38.4	51	18	318	−37.2	54	14	308	−42.9	----	23	331	−27.6	45	26	329	−28.7	61
10,000	28	268	−46.9	----	22	269	−46.4	----	28	265	−49.4	----	17	273	−44.0	----	17	275	−44.6	----	13	264	−48.4	----	23	288	−35.4	43	24	286	−36.8	60
11,000	28	230	−49.9	----	22	231	−50.6	----	26	228	−50.6	----	15	235	−48.7	----	17	237	−51.1	----	13	228	−49.2	----	22	249	−43.3	----	22	246	−45.5	----
12,000	28	197	−49.7	----	21	198	−49.4	----	26	195	−49.3	----	15	201	−52.9	----	17	202	−55.6	----	13	195	−46.4	----	22	214	−51.3	----	18	211	−54.6	----
13,000	27	170	−48.9	----	20	170	−48.6	----	24	167	−47.8	----	14	172	−53.0	----	16	172	−57.0	----	13	168	−45.1	----	22	183	−58.6	----	16	180	−64.1	----
14,000	24	145	−49.1	----	19	146	−48.6	----	22	144	−47.8	----	13	147	−51.7	----	15	147	−55.5	----	11	145	−44.7	----	22	156	−65.0	----	15	152	−73.3	----
15,000	22	125	−48.9	----	17	125	−48.9	----	21	123	−47.7	----	10	126	−51.7	----	14	126	−55.3	----	10	125	−44.6	----	21	132	−70.0	----	12	128	−80.8	----
16,000	21	107	−49.0	----	17	108	−48.9	----	19	106	−47.0	----	10	108	−51.4	----	13	108	−55.4	----	9	108	−44.5	----	20	111	−73.0	----	12	107	−87.2	----
17,000	17	92	−48.8	----	16	93	−48.3	----	18	91	−46.4	----	7	92	−50.6	----	10	92	−54.9	----	7	93	−44.6	----	18	94	−73.1	----	10	89	−87.0	----
18,000	13	79	−48.3	----	14	79	−47.6	----	15	78	−45.8	----	6	78	−49.8	----	8	78	−54.6	----	5	80	−44.2	----	17	79	−70.6	----	6	75	−84.6	----
19,000	10	68	−47.9	----	10	68	−47.0	----	15	67	−45.5	----	5	67	−48.4	----	----	----	----	----	----	----	----	----	13	67	−68.1	----	6	62	−76.6	----
20,000	8	58	−47.6	----	9	59	−46.5	----	8	58	−45.4	----	----	----	----	----	----	----	----	----	----	----	----	----	8	57	−64.9	----	----	----	----	----
21,000	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	5	48	−61.6	----	----	----	----	----
22,000	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	5	40	−58.9	----	----	----	----	----

LATE REPORT FOR JULY 1942

Altitude (meters) m. s. l.	Station and elevation in meters above sea level: Fairbanks, Alaska (156 m.) — Number of observations	Pressure	Temperature	Relative humidity	Altitude (meters) m. s. l.	Station and elevation in meters above sea level: Fairbanks, Alaska (156 m.) — Number of observations	Pressure	Temperature	Relative humidity
Surface	31	994	20.2	51	10,000	30	270	−47.5	
500	31	955	17.1	54	11,000	30	232	−49.8	
1,000	31	900	12.7	60	12,000	30	199	−48.2	
1,500	31	848	8.8	68	13,000	30	171	−47.1	
2,000	31	798	5.0	76	14,000	28	147	−46.8	
2,500	31	750	1.8	80	15,000	27	127	−46.6	
3,000	31	705	−0.8	81	16,000	26	109	−46.5	
4,000	31	622	−6.3	73	17,000	24	94	−46.3	
5,000	30	546	−12.5	66	18,000	22	81	−45.8	
6,000	30	478	−19.5	65	19,000	18	70	−45.3	
7,000	30	417	−26.5	62	20,000	12	60	−44.7	
8,000	30	362	−34.1	62	21,000	7	52	−44.3	
9,000	30	313	−41.5						

CORRECTED DATA FOR JULY 1942

Altitude (meters) m. s. l.	Station and elevation in meters above sea level: Lake Charles, La. (5 m.) — Number of observations	Pressure	Temperature	Relative humidity	Altitude (meters) m. s. l.	Station and elevation in meters above sea level: Lake Charles, La. (5 m.) — Number of observations	Pressure	Temperature	Relative humidity
Surface	31	1017	25.7	89	9,000	30	333	−26.4	48
500	31	961	24.8	73	10,000	30	290	−33.9	48
1,000	31	908	22.2	69	11,000	29	250	−41.8	
1,500	31	857	19.6	62	12,000	29	216	−49.7	
2,000	31	809	16.7	59	13,000	27	185	−57.2	
2,500	31	762	13.9	56	14,000	26	156	−63.5	
3,000	31	718	11.1	54	15,000	26	133	−68.2	
4,000	31	637	5.7	50	16,000	22	113	−70.8	
5,000	31	563	−0.1	52	17,000	19	95	−71.3	
6,000	31	496	−6.0	52	18,000	17	80	−69.4	
7,000	31	436	−12.4	50	19,000	16	68	−66.4	
8,000	30	382	−19.3	49	20,000	7	58	−63.1	

All observations taken at 11:00 p. m., 75th meridian time.
None of the means included in this table are based on less than 15 surface or 5 standard level observations.

Number of observations refers to pressure only, as temperature and humidity are missing for some observations at certain levels, also, the humidity data are not used in daily observations when the temperature is below −40° C.
Stations marked with the figure one (1) are Navy stations.

TABLE 2.—*Free-air resultant winds based on pilot-balloon observations made near 5 p. m. (75th meridian time) during August 1942. Directions given in degrees from North (N=360°, E=90°, S=180°, W=270°)—Velocities in meters per second*

Altitude (meters) m. s. l.	Abilene, Tex. (538 m.)			Albuquerque, N. Mex. (1,630 m.)			Atlanta, Ga. (299 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (512 m.)			Boise, Idaho 866 m.)			Brownsville, Tex. (7 m.)			Buffalo, N. Y. (220 m.)			Burlington, Vt. (132 m.)			Charleston, S. C. (17 m.)			Cincinnati, Ohio (152 m.)			Denver, Colo. (1,627 m.)			El Paso, Tex. (1,196 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	31	155	3.6	31	165	0.2	31	194	0.9	31	30	2.2	31	313	1.4	31	320	4.6	31	132	5.0	31	234	2.5	30	225	1.1	31	152	1.7	31	86	0.5	31	60	2.8	31	172	1.5
500							31	191	1.3										31	133	6.6	31	246	3.9	30	229	2.5	31	178	2.6	31	164	0.4						
1,000	31	140	4.6				31	207	1.6				31	258	1.2	31	318	4.7	30	142	5.4	29	236	4.3	29	252	3.6	30	194	2.0	31	242	1.6						
1,500	31	149	4.8				30	246	2.7	31	355	1.6	30	263	1.7	31	315	4.1	30	146	4.2	27	249	5.3	28	269	5.8	28	218	2.1	31	261	2.5	31	156	1.6
2,000	30	157	3.9	31	200	0.6	28	253	3.1	31	334	0.6	27	278	5.4	31	301	2.8	29	144	4.3	23	259	6.0	25	273	7.2	22	245	3.4	28	272	4.0	31	60	3.2	31	155	0.9
2,500	28	166	4.0	31	202	0.8	27	260	2.8	31	266	2.9	20	269	6.4	30	288	2.7	27	136	4.0	16	264	5.9	20	274	6.5	21	256	3.6	26	266	5.7	31	72	2.6	31	127	0.9
3,000	21	211	2.7	31	154	0.9	25	262	3.3	27	255	4.9	18	281	7.8	30	268	3.4	24	119	3.1	12	274	4.8	16	280	6.1	21	247	3.6	24	278	5.3	31	121	1.8	30	40	0.6
4,000	17	259	2.2	31	315	1.3	21	274	2.9	27	264	9.0	15	275	11.9	30	253	6.4	20	126	3.7				10	306	4.7	18	243	3.9	20	284	5.9	30	266	3.9	29	353	0.3
5,000	15	295	2.7	31	289	1.6	18	267	4.0	25	268	11.7	13	279	12.7	28	264	8.1	18	119	3.3							15	233	4.3	16	287	6.1	28	271	6.5	29	318	0.9
6,000	10	288	2.1	24	269	2.9	15	289	4.2	23	270	13.4	13	286	15.3	27	257	8.4	16	111	2.8							11	240	5.4	12	296	7.9	20	274	7.8	25	289	1.3
8,000				21	248	5.2	11	285	4.1	19	269	13.7				25	266	9.1																13	267	10.9	21	235	4.0
10,000				16	246	8.4	11	301	4.5	11	278	16.9				20	278	13.8																12	261	15.7	17	235	5.1
12,000																16	271	19.2																11	270	21.4	12	237	6.2
14,000																																		10	274	17.5	11	227	3.0

TABLE 2.—*Free-air resultant winds based on pilot-balloon observations made near 5 p. m. (75th meridian time) during August 1942. Directions given in degrees from North (N=360°, E=90°, S=180°, W=270°)—Velocities in meters per second*—Continued

Altitude (meters) m. s. l.	Ely, Nev. (1,910 m.)			Grand Junction, Colo. (1,413 m.)			Greensboro, N. C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Joliet, Ill. (178 m.)			Las Vegas, Nev. (570m.)			Little Rock, Ark. (88m.)			Medford, Oreg. (410 m.)			Miami, Fla. (15 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (194 m.)			New York, N. Y. (15 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Directions	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	31	222	2.1	31	281	0.9	30	186	1.0	28	313	0.7	31	98	2.5	---	---	---	31	184	2.3	30	130	1.0	31	304	1.9	30	116	3.5	29	178	2.0	30	210	0.3	30	199	1.2
500	---	---	---	---	---	---	30	194	2.2	---	---	---	31	139	1.7	---	---	---	---	---	---	30	157	1.7	31	310	2.4	30	115	4.5	29	166	2.5	30	224	0.8	30	236	3.1
1,000	---	---	---	---	---	---	30	209	1.9	28	319	1.0	27	181	2.1	---	---	---	31	188	3.1	29	193	0.6	31	322	2.1	30	112	4.7	27	158	2.4	30	233	1.1	28	263	3.9
1,500	---	---	---	---	---	---	30	244	2.9	28	297	1.6	24	221	3.2	---	---	---	31	183	3.9	25	219	1.6	31	308	1.4	27	112	4.2	23	153	1.8	30	263	1.5	26	282	3.9
2,000	31	239	2.6	31	276	1.8	26	261	3.4	27	275	1.6	22	228	3.2	---	---	---	31	195	3.7	22	226	2.8	31	313	1.5	27	112	3.9	21	169	1.3	26	257	1.6	22	290	5.0
2,500	31	242	3.2	31	270	2.4	26	273	4.6	23	259	4.1	21	225	2.9	---	---	---	30	214	3.9	17	239	3.1	31	199	2.0	26	117	4.0	17	206	1.2	21	258	1.7	19	279	5.9
3,000	31	243	3.2	31	249	3.0	25	275	5.6	20	261	5.4	21	225	3.4	---	---	---	30	214	3.4	14	244	2.9	31	214	2.2	27	115	4.3	15	188	1.9	20	314	1.9	15	288	5.8
4,000	29	242	3.9	30	251	3.3	21	265	6.3	16	266	9.2	18	195	3.5	---	---	---	30	213	4.1	10	299	1.8	30	235	3.7	23	115	3.8	---	---	---	17	287	3.4	10	308	5.9
5,000	27	239	5.0	28	256	4.5	20	262	7.7	13	263	11.2	15	215	2.8	---	---	---	28	215	5.2	---	---	---	30	229	5.2	17	119	2.4	---	---	---	13	281	2.8	---	---	---
6,000	23	242	7.4	27	261	4.8	18	265	8.7	---	---	---	13	201	2.5	---	---	---	27	251	5.4	---	---	---	29	246	5.5	14	108	2.4	---	---	---	12	272	3.5	---	---	---
8,000	19	247	14.3	17	247	8.9	12	267	7.0	---	---	---	---	---	---	---	---	---	25	248	9.3	---	---	---	27	239	9.1	11	95	3.2	---	---	---	---	---	---	---	---	---
10,000	15	242	18.8	---	---	---	12	273	9.0	---	---	---	---	---	---	---	---	---	23	254	13.1	---	---	---	26	247	12.0	---	---	---	---	---	---	---	---	---	---	---	---
12,000	11	250	19.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	20	256	14.7	---	---	---	23	250	16.0	---	---	---	---	---	---	---	---	---	---	---	---
14,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	20	255	11.8	---	---	---	20	256	15.1	---	---	---	---	---	---	---	---	---	---	---	---
16,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	18	227	4.5	---	---	---	13	253	8.0	---	---	---	---	---	---	---	---	---	---	---	---

Altitude (meters), m. s. l.	Oakland, Calif. (8 m.)			Oklahoma City, Okla. (402 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Louis, Mo. (181 m.)			St. Paul, Minn. (225 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (15 m.)			Sault St. Marie, Mich. (230 m.)			Seattle, Wash. (12 m.)			Spokane, Wash. (603 m.)			Washington, D. C. (24 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	31	279	5.3	29	165	3.7	30	177	2.4	31	257	0.5	31	55	1.5	31	158	1.0	31	200	2.5	30	137	3.4	31	279	3.5	30	298	1.9	31	260	2.0	31	105	0.2	30	185	1.8
500	31	267	3.4	29	162	4.3	30	178	3.5	31	267	1.5	---	---	---	31	193	1.4	31	217	2.9	30	134	4.8	31	274	2.5	30	261	2.0	31	297	1.1	---	---	---	30	202	2.2
1,000	31	252	2.4	29	160	4.5	30	195	3.2	31	244	1.7	31	63	1.5	31	219	1.7	29	234	4.2	30	141	4.9	29	299	1.7	28	255	3.5	27	337	2.1	31	252	1.1	28	248	2.7
1,500	31	241	2.7	29	183	4.3	30	218	3.7	31	232	2.1	31	103	0.8	31	235	2.5	27	240	5.8	29	146	4.8	29	292	1.3	26	256	5.4	26	332	1.3	31	263	1.6	28	259	3.9
2,000	30	236	2.7	27	201	4.3	29	245	4.4	31	208	1.9	30	189	1.3	29	271	2.6	21	268	4.7	28	150	4.2	27	253	1.6	23	265	6.7	24	262	0.6	31	271	2.1	25	276	5.2
2,500	29	222	2.8	26	238	4.1	28	255	4.3	31	209	1.6	29	240	2.7	26	281	3.5	14	278	4.9	26	154	3.5	26	204	1.9	18	280	7.9	22	342	0.7	30	266	3.0	24	277	5.6
3,000	29	222	2.9	25	263	4.4	26	267	4.9	31	210	1.7	25	268	5.3	24	273	3.9	11	274	6.2	25	165	3.4	25	200	2.2	14	294	6.7	20	320	1.3	29	277	4.5	23	275	5.4
4,000	29	211	3.5	22	298	4.2	25	281	6.6	30	143	0.8	21	273	7.9	21	290	5.1	---	---	---	18	161	1.2	24	180	2.1	---	---	---	19	296	2.3	25	273	6.5	20	276	5.8
5,000	28	226	4.5	19	302	5.5	21	288	8.2	26	188	1.0	18	266	9.3	17	293	5.7	---	---	---	14	235	0.7	23	170	1.2	---	---	---	17	247	4.0	21	270	8.2	17	278	8.1
6,000	27	236	5.4	17	297	6.2	20	290	9.8	26	202	1.5	13	257	12.5	13	291	7.4	---	---	---	13	217	1.6	23	179	0.2	---	---	---	16	271	4.8	20	277	8.4	15	274	10.3
8,000	22	252	6.9	14	284	9.8	15	290	10.9	22	256	4.0	12	253	15.9	---	---	---	---	---	---	10	330	2.2	---	---	---	---	---	---	12	252	7.2	14	276	8.3	---	---	---
10,000	22	258	12.2	10	300	11.7	10	264	17.2	22	241	7.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	10	266	7.4	12	262	12.1	---	---	---
12,000	18	250	15.4	---	---	---	---	---	---	22	236	10.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	10	264	15.1	---	---	---
14,000	15	251	15.7	---	---	---	---	---	---	16	238	9.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
16,000	10	264	5.0	---	---	---	---	---	---	11	215	2.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

TABLE 3.—*Maximum free-air wind velocities (m. p. s.), for different sections of the United States based on pilot-balloon observations during August 1942*

Section	Surface to 2,500 meters (m. s. l.)					Between 2,500 and 5,000 meters (m. s. l.)					Above 5,000 meters (m. s. l.)				
	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station
Northeast [1]	29.3	W	1,720	3	Boston, Mass	38.5	WSW	4,780	24	Boston, Mass	57.6	WNW	9,310	5	Portland, Maine.
East-Central [2]	23.5	SW	620	23	Hatteras, N. C	30.4	W	4,970	24	Washington, D. C	44.4	WSW	10,440	9	Washington, D. C.
Southeast [3]	22.2	W	630	5	Charleston, S. C	21.6	WNW	2,630	5	Birmingham, Ala	30.5	SW	10,420	31	Tampa, Fla.
North-Central [4]	34.3	W	1,220	19	Sault Ste Marie, Mich	33.8	SW	2,990	21	La Crosse, Wis	59.0	W	12,130	4	Detroit, Mich.
Central [5]	40.9	S	1,210	5	Dodge City, Kans	27.8	NW	4,180	7	North Platte, Nebr	40.8	W	12,050	4	Omaha, Nebr.
South-Central [6]	30.7	SSE	630	30	Houston, Tex	21.5	NNW	4,980	10	Tulsa, Okla	33.3	NW	11,810	11	Amarillo, Tex.
Northwest [7]	30.9	NW	1,700	20	Ellensburg, Wash	30.4	SSW	5,000	3	Medford, Oreg	61.0	WSW	11,800	1	Billings, Mont.
West-Central [8]	24.9	SSW	1,630	29	Grand Junction, Colo	30.8	SW	4,320	6	Reno, Nev	62.0	SW	8,880	27	Ely, Nev.
Southwest [9]	25.4	SSW	2,290	29	Winslow, Ariz	33.8	SSW	5,000	28	Las Vegas, Nev	46.8	SW	12,610	27	Las Vegas, Nev.

[1] Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania and northern Ohio.
[2] Delaware, Maryland, Virginia, West Virginia, southern Ohio, Kentucky, eastern Tennessee, and North Carolina.
[3] South Carolina, Georgia, Florida, and Alabama.
[4] Michigan, Wisconsin, Minnesota, North Dakota, and South Dakota.
[5] Indiana, Illinois, Iowa, Nebraska, Kansas and Missouri.
[6] Mississippi, Arkansas, Louisiana, Oklahoma, Texas (except El Paso), and western Tennessee.
[7] Montana, Idaho, Washington, and Oregon.
[8] Wyoming, Colorado, Utah, northern Nevada, and northern California.
[9] Southern California, southern Nevada, Arizona, New Mexico, and extreme west Texas.

RIVER STAGES AND FLOODS

By BENNETT SWENSON

A number of local rain storms of unusual intensity occurred in various parts of the country during August. Noteworthy also were the high monthly totals of precipitation in the Middle Atlantic area which had one of the wettest Augusts of record.

Floods during the month were mainly local floods resulting from intense rains over small areas and which, in some cases, caused considerable damage. Floods occurred principally in New York, Pennsylvania, New Jersey, Virginia, North Carolina, Michigan, Iowa, Nebraska, Kansas, Oklahoma, and Texas.

St. Lawrence drainage.—The following report of damaging floods in Upper Michigan on August 21–22 is submitted by the Official in Charge, East Lansing, Mich.:

During the night of August 21–22, excessive rains fell over much of western Upper Michigan, centering particularly in the central and lower parts of the Ontonagon, and the upper reaches of the Potato and Cranberry River basins. The resulting flood waters in those streams and their tributaries caused much damage to highways, bridges, and other property in their paths. Three persons were drowned when the cabin in which they were sleeping, located on a creek tributary to the Potato River, was carried away.

Flood waters mounted higher than the floors of highway bridges over the Baltimore River and over the Middle Branch of the Ontonagon. A bridge over the Main Ontonagon near Rockland was carried away, and several culverts were washed out. Relatively little damage was suffered by crops.

Most of the rain fell during a period of a few hours. The rainfall at Kenton amounted to 4.92 inches, and at Ewen to 8.25 inches, while unofficial measurements exceeding 10 inches were reported from a few places.

Station	Amount (inches)	Began 21st	Ended 22d
Ironwood	2.38	8 p. m.	6:30 a. m.
Ontonagon	2.42	6 p. m. to 9 p. m., and later during the night.	
Mass	3.48	7:20 p. m.	3:15 a. m.
Watersmeet	1.25	Midnight	5 a. m.
Stambaugh	1.70	During the night	
Ewen	8.25	7:30 p. m.	After 1 a. m.
Kenton	4.92	8:30 p. m.	6:45 a. m.
Painesdale	1.10	7 p. m. to 10 p. m. (21st).	
Houghton	1.77	6 p. m.	3 a. m.
L'Anse	1.05	During the night	7 a. m.
Michigamme	2.80	10 p. m.	6 a. m.
Ishpeming	2.65	10:20 p. m.	7:30 a. m.
Marquette	1.66	21st	22d: less than 24 hrs.

Atlantic Slope drainage.—A severe thunderstorm in the vicinity of Greenfield, Montague City, Millers Falls, and Turners Falls, Mass., occurred during the late afternoon of August 14, causing considerable damage, but did not produce flood stages in the tributary or main river. At Montague City, 4.23 inches of rain fell in 4½ hours.

On August 13, heavy rains caused streams to flood in southern Schuyler and Tompkins Counties in New York. There was considerable damage to roads, bridges and crops and some homes in Watkins Glen and Montour Falls were flooded. Rapid rises occurred in the Chemung River basin but did not reach flood stage in the main streams. On August 22, thunderstorms and heavy rains in the Westfield-Fredonia, N. Y., area flooded highways and washed out roads and bridges. Due to undermining, a train was derailed near Mayville, N. Y., killing one person.

Slight overflows occurred in the Susquehanna River at Oneonta, N. Y., on the 1st and again on the 17th but no appreciable damage resulted.

In the Delaware River Basin, flash flooding occurred in the vicinity of Perkasie, Pa., on the 8th, 9th, and 10th, and a flood on Brandywine Creek on the 9th, produced a stage at Chadds Ford of 14.8 feet, or 0.2 foot lower than the 1936 flood. Considerable damage was caused by the heavy rains. High water in Perkiomen Creek resulted in some flooding in the Schuylkill at Philadelphia where the crest on August 9 was from 1 to 2 feet higher than in the flood of May 23, 1942.

Overflow in the Anticosti River northeast of the city of Washington occurred between August 7 and 11. In the District of Columbia, between 5 and 7 inches of rain fell within 48 hours on August 7–9. Local heavy rains in the middle James River basin caused slight flooding in the James River at Bremo Bluff, Va., on August 14–15 and at Columbia, Va. The heaviest rains occurred in Amherst County on the 14th, and a flash flood in Beck's Creek near Lynchburg, Va., caused a sudden rise in the James River of 7 feet at Lynchburg.

Near the middle of the month, light to very heavy showers occurred over eastern North Carolina. Fayetteville, N. C., on the Cape Fear, reported a 48-hour amount of 7.73 inches, 6.20 inches of this occurring in the 24 hours ending on the morning of the 13th. The stages in the Cape Fear were low and flood stages were not reached. Light overflows, however, occurred in the Roanoke and Neuse Rivers.

Upper Mississippi Basin.—No flooding occurred in the main channel of the Mississippi, however excessively heavy local rains caused light to moderate floods in the Iowa, Cedar, and Rock Rivers and slight overflows in the Zumbro, Whitewater, and Root Rivers.

A heavy rain of 5.25 inches at Waterloo, Iowa, on July 30, and heavy to excessive rains at points near there on July 29–30, started a rise in the Cedar River at Waterloo reaching a crest stage of 12.2 feet on August 1. On August 1–2 heavy to excessive rains continued near Cedar Rapids, Iowa. These rains combined with the rise at Waterloo, produced flood stages in the Iowa River at Wapello, Iowa.

Exceptionally intense rains over the Rock River basin in northern Illinois and southern Wisconsin on August 1–2 caused some flooding in that river. A crest stage of 10.2 feet (0.2 foot above flood stage) was reached near the mouth at Moline, Ill., on August 9.

Missouri River Basin.—High water in the Big Sioux River, which began during the last part of July, continued into August, cresting at Akron, Iowa, on the 2d at 18.3 feet. Heavy rains occurred again on August 28–29, averaging about 3 inches over the upper Floyd River area, causing moderate overflow from Sheldon, Iowa, to below James, Iowa. The Big Sioux River also was affected by the rainfall and overflowed somewhat.

A flood in the Republican River resulted from heavy rains in the vicinity of Superior, Nebr., and downstream to Scandia, Kans. The average depth of rainfall was 2.6 inches with the heaviest amounts at Superior (6.37 inches) and at Hardy, Nebr., (4.76 inches). Damages were confined to the lowest fields along the stream with more extended areas flooded near Scandia, Kans.

Slight overflows which caused no material damage occurred in the Little Blue River from Endicott, Nebr., to below Hanover, Kans. A moderate overflow of 3.5 feet was reached in the upper Solomon River at Beloit, Kans., on August 16, with some damage to crops in the lowlands.

Ohio Basin.—Local flooding occurred in the Tygart River at Dailey, W. Va., on August 9 and in the upper Holston River in Tennessee and Virginia on August 9 and 10, with more extensive floods in the Wabash River from August 1 to 5.

A report on the flooding in the Wabash River is submitted by the Official in Charge, Indianapolis, Ind., as follows:

For practically the entire month river stages throughout the Wabash River Valley were quite low. The only exception was that of a rapid rise and light to moderate flooding in the upper stretches of the Wabash River from below LaFayette to past Bluffton, Ind., near the source, as a result of excessive rainfall on the night of July 30–31, preceding. These excessive rains were confined to the area of the upper Wabash Valley, including the southern tributaries, as well as the Tippecanoe Valley on the north, and amounted to an average of about 3.5 inches from below Logansport upstream. This rather restricted and very heavy fall was undoubtedly due to the presence of moist tropical air in the upper portion of a depression trough, as influenced by the action of the fronts outlined on the 1:30 AM EST map. Rainfall was substantial but much less in amount to the northward, as well as to the southward over the upper West Fork of the White. In these areas however, it was not sufficient to produce flood waters, and faded to practically nothing in much of the south half of the State, including the Wabash Valley from and below Covington, Ind.

In general, the excessive rains began about 9 to 10 p. m. on July 30 and continued until 5 to 6 a. m. of July 31. The initial rise in the central section of the Wabash was rapid and most pronounced, as indicated by the record of the Wabash, Ind., gage; but while steady, was somewhat slower in the other sections of the district. The particularly rapid rise at Wabash was probably due to the extremely great amount of rain falling over the Salamonie tributary, which empties into the main river a short distance above the Wabash gage. Over this Salamonie section the fall was approximately 1 inch greater than in the other parts of the excessive rainfall area; and evidently passed the rate of infiltration and the initial detention capacity of the soil much sooner and in greater degree than elsewhere.

Arkansas Basin.—Heavy rains in the upper Neosho River basin caused a slight overflow at Burlington, Kans., on August 26.

Exceptionally intense rains over a period of a few hours in a small area east of Stillwater, Okla., and west of Perkins, Okla., produced unusually high stages in the smaller streams in the area between Stillwater and Tulsa, Okla. Council Creek, near Stillwater, reached the highest stage known. Damage was considerable.

West Gulf of Mexico drainage.—A severe local rain storm between Sanderson and Longfellow, Tex., on August 23, resulted in very high rates of discharge in Downy Draw and Sanderson Valley, which are both dry as a rule.

There was some overflow in the Rio Hondo in the vicinity of Roswell, N. Mex. The overflow was the result of abnormally high flow sustained throughout the month and a heavy local thundershower on August 29 over the watershed above Roswell.

FLOOD-STAGE REPORT FOR AUGUST 1942

[All dates in August unless otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE	*Feet*			*Feet*	
Susquehanna: Oneonta, N. Y.	12	1	1	12.4	1
		17	17	12.1	17
James:					
Bremo Bluff, Va.	19	14	15	20.1	14–15
Columbia, Va.	10	8	16	16.8	10
		19	20	19.4	15
				12.6	19
Roanoke:					
Randolph, Va.	21	9	10	23.4	10
Weldon, N. C.	31	10	12	37.6	11
		19	21	33.1	20
Williamston, N. C.	10	15	29	11.0	23–26
Neuse: Smithfield, N. C.	13	19	22	14.5	20–21
MISSISSIPPI SYSTEM					
Upper Mississippi Basin					
Rock: Moline, Ill.	10	8	11	10.2	9
Cedar: Waterloo, Iowa	12	1	1	12.2	1
Iowa: Wapello, Iowa	10	6	8	11.0	7
Missouri Basin					
Big Sioux: Akron, Iowa	12	July 31	5	18.3	2
Floyd: James, Iowa	14	31	Sept. 3	16.2	Sept. 2
Solomon: Beloit, Kans.	18	14	17	21.5	16
Republican:					
Scandia, Kans.	10	26	26	12.3	26
Concordia, Kans.	8	26	26	8.8	26
Clay Center, Kans.	15	27	27	15.6	27
Little Blue:					
Endicott, Nebr.	11	27	29	14.4	28
Hanover, Kans.	14	28	30	15.8	29
Ohio Basin					
Tygart: Dailey, W. Va.	9	9	9	9.6	9
		24	24	11.4	24
Kentucky: Lock No. 9, Valley View, Ky.	20	23	23	20.8	23
Wabash:					
Bluffton, Ind.	10	2	5	11.7	3
Wabash, Ind.	12	2	4	12.4	4
Lafayette, Ind.	11	1	2	12.7	2
Arkansas Basin					
Neosho: Burlington, Kans.	23	26	26	24.5	26

CLIMATOLOGICAL DATA

CONDENSED CLIMATOLOGICAL SUMMARY OF TEMPERATURE AND PRECIPITATION BY SECTIONS

[For description of tables and charts, see REVIEW, January 1940, p. 32]

In the following table are given for the various sections of the climatological service of the Weather Bureau the monthly average temperature and total rainfall; the stations reporting the highest and lowest temperatures, with dates of occurrence; the stations reporting the greatest and least total precipitation; and other data as indicated by the several headings.

The mean temperature for each section, the highest and lowest temperatures, the average precipitation, and the greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperatures and precipitation are based only on records from stations that have 10 or more years of observations. Of course, the number of such records is smaller than the total number of stations

Section	Temperature								Precipitation					
			Monthly extremes								Greatest monthly		Least monthly	
	Section average	Departure from the normal	Station	Highest	Date	Station	Lowest	Date	Section average	Departure from the normal	Station	Amount	Station	Amount
	°F.	°F.		°F.			°F.		In.	In.		In.		In.
Alabama	78.7	−1.1	Madison	101	1	3 stations	53	[1] 25	6.43	+1.90	Centerville	13.83	Pine Hill	1.46
Arizona	77.8	−.7	2 stations	115	3	do	29	[1] 27	1.86	−.48	Portal	7.92	Parker	.06
Arkansas	78.8	−1.3	Conway	106	1	do	53	[1] 24	5.96	+2.35	Springbank	14.87	Ozark	1.83
California	72.6	+.2	Cow Creek	123	8	2 stations	25	[1] 1	.16	+.06	Silver Lake	3.04	178 stations	.00
Colorado	65.6	.0	Las Animas	102	1	Pearl	22	31	1.59	−.34	Karval	7.49	Northdale	.08
Florida	81.7	+.3	2 stations	102	[1] 5	Vernon	58	27	5.39	−1.61	St. Leo	14.20	Key West	1.53
Georgia	78.5	−1.0	Eastman	104	[1] 1	Blairsville	45	28	5.76	+.48	Dalton	12.30	Savannah No. 2	2.31
Idaho	67.0	+.6	2 stations	108	[1] 7	Sun Valley	20	28	.22	−.42	New Meadows	1.14	13 stations	.00
Illinois	73.4	−1.1	3 stations	101	[1] 1	2 stations	39	24	3.56	+.19	Elizebethtown	9.77	3 stations	.82
Indiana	73.0	−.6	Seymour	103	2	La Porte	39	25	3.71	+.37	Shelbyville	8.26	Hazelton	1.10
Iowa	72.2	.0	2 stations	101	1	Decorah	34	24	3.17	−.41	Cresco	7.08	Oto	.81
Kansas	76.9	−1.0	Hill City	108	1	Burr Oak	48	23	4.57	+1.40	Valley Falls	10.80	Scott City	1.21
Kentucky	74.9	−.9	2 stations	104	[1] 1	Lynch (near)	42	28	6.56	+2.82	Richmond	13.00	Earlington	2.21
Louisiana	81.8	.0	do	102	[1] 2	Tallulah	61	28	6.15	+.96	Pearl River	14.39	Calhoun	1.06
Maryland-Delaware	72.8	−.7	Crisfield, Md	97	[1] 1	Sines, Md	35	[1] 25	7.34	+2.74	Pocomoke City, Md	12.20	Millington, Md	3.83
Michigan	67.1	+.1	Marquette	99	21	Kenton	27	24	2.80	+.02	Bloomingdale	9.68	St. James	.24
Minnesota	67.6	.0	New Ulm	97	21	Meadowlands	27	24	4.67	+1.41	Cass Lake	11.48	New Ulm	1.40
Mississippi	79.8	−.9	Clarkdale	103	1	Booneville	54	25	5.71	+1.48	Durant	14.17	Houston	1.40
Missouri	75.1	−1.4	Sikeston	106	2	Louisiana	41	25	4.24	+.41	Poplar Bluff	11.19	Memphis	1.29
Montana	65.3	+.2	6 stations	103	[1] 19	Hebgen Dam	21	31	.93	−.14	King's Hill	3.39	Lima	T
Nebraska	73.8	+.5	Lincoln Agronomy Farm.	107	1	Chadron	35	[1] 15	2.46	−.24	Superior	7.40	Gordon	.00
Nevada	72.8	+2.1	2 stations	113	3	Beowawe	18	30	.31	−.19	Charleston Ranger Station.	5.18	17 stations	.00
New England	67.6	+.6	Cornwall, Vt	94	22	Bangor, Maine	29	25	2.83	−.96	New Haven, Conn	10.14	Gilman, Vt	.63
New Jersey	71.3	−.7	Little Falls	98	1	Charlotteburg	35	26	8.24	+3.49	Canoe Brook	14.65	Freehold	3.65
New Mexico	70.3	−.4	Orogrande	103	1	Eagle Nest	31	19	3.34	+.90	Fort Sumner	10.17	Gower	.14
New York	67.6	.0	Sodus	93	15	Lake Placid Club	29	25	3.53	−.22	New York University	11.58	Albany	.66
North Carolina	75.2	−.7	3 stations	105	[1] 2	Mount Mitchell	38	26	6.89	+1.29	Fayetteville	16.02	Mount Gilead	3.15
North Dakota	66.3	−.2	Hettinger	105	20	2 stations	33	23	3.09	+1.05	Cavalier	8.48	Mott	1.10
Ohio	71.3	−.4	Portsmouth	98	2	Canton	35	25	3.48	+.08	Holgate	8.22	Akron	1.10
Oklahoma	79.8	−1.6	2 stations	109	2	Kenton	45	23	4.78	+1.82	Perkins	11.28	Kenton	.66
Oregon	66.2	+.8	do	108	[1] 15	Freemont	19	29	.24	−.18	Antelope	1.41	11 stations	.00
Pennsylvania	69.5	−.8	Selinsgrove	96	14	Kane	27	25	4.50	+.28	Marcus Hook	13.77	Titusville	.99
South Carolina	78.2	−.7	Columbia Airport	103	1	Caesars Head	47	26	5.68	−.08	Pelzer	12.46	Summerville	1.64
South Dakota	71.3	+.3	Pierre	106	20	Ralph	32	23	2.08	−.02	Britton	10.22	Ardmore	.10
Tennessee	75.7	−1.0	2 stations	105	[1] 1	2 stations	45	25	6.88	+2.82	Sewanee	13.08	Perryville	2.90
Texas	81.7	−1.1	4 stations	108	[1] 1	Stratford	41	23	4.32	+2.01	Woodsboro	13.69	San Benito	.35
Utah	70.1	+.3	St. George	107	[1] 3	3 stations	28	[1] 30	.66	−.37	Enterprise (near)	3.21	2 stations	.00
Virginia	73.4	−.7	2 stations	104	[1] 2	Mountain Lake	34	26	8.71	+4.19	Norfolk	15.61	Kenbridge	3.66
Washington	68.7	+2.8	Wahluke (near)	111	19	Deer Park (near)	27	29	.33	−.50	Cedar Lake	1.66	6 stations	.00
West Virginia	71.1	−.7	Logan	100	2	Bayard	30	26	7.22	+3.08	Valley Head	15.03	New Cumberland	1.52
Wisconsin	67.7	.0	High Falls	97	21	Coddington	27	24	2.63	−.70	Darlington	7.14	Kewaunee	.46
Wyoming	65.2	+1.2	3 stations	101	[1] 2	Big Piney	22	31	.65	−.45	Newcastle	3.36	2 stations	
Alaska (July)	56.2	+.7	View Cove	91	28	Jack Wade	30	2	2.72	+.11	Kimshan Nove	13.64	Cooper Center	.26
Hawaii	76.0	+.9	Waianae	95	29	Nui Ridge	50	[1] 1	6.03	−.44	Kukui	38.00	4 stations	.00
Puerto Rico	79.2	+.3	2 stations	97	[1] 2	Guineo Reservoir	57	29	6.86	−.20	Toa Alta	14.55	Santa Isabel	2.60

[1] Other dates also.

CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS

District and station	Elevation of instruments: Barometer above sea level	Elevation of instruments: Thermometer above ground	Elevation of instruments: Anemometer above ground	Pressure: Station, reduced to mean of 24 hours	Pressure: Sea level, reduced to mean of 24 hours	Pressure: Departure from normal	Temperature of the air: Mean max. + mean min. ÷ 2	Temperature of the air: Departure from normal	Temperature of the air: Maximum	Temperature of the air: Date	Temperature of the air: Mean maximum	Temperature of the air: Minimum	Temperature of the air: Date	Temperature of the air: Mean minimum	Temperature of the air: Greatest daily range	Mean wet thermometer	Mean temperature of the dewpoint	Mean relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Days with 0.01 inch or more	Wind: Average hourly velocity	Wind: Prevailing direction	Wind: Maximum velocity: Miles per hour	Wind: Maximum velocity: Direction	Wind: Maximum velocity: Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month	Number of days with thunderstorms
	Ft.	*Ft.*	*Ft.*	*In.*	*In.*	*In.*	°F.	°F.	°F.		°F.	°F.		°F.	°F.	°F.	°F.	%	*In.*	*In.*		*Miles*								*0–10*	*In.*	*In.*	
New England							**66.8**	**+0.2**										**80**	**3.96**	**+0.4**										**5.2**			
Eastport	75	67	85	29.94	30.02	+0.06	61.6	+0.9	80	21	70	48	26	53	27	57	54	84	1.88	−1.1	12	7.2	sw.	18	nw.	3	10	12	9	5.1	0.0	0.0	0
Greenville, Me.	1,070	6	41	28.88	30.03	.....	62.4	+.2	88	22	76	32	26	49	42	58	56	...	4.14	+.8	11	.....	nw.	...	...	...	3	15	13	...	.0	.0	4
Portland, Me.[1]	103	5	36	29.91	30.02	+.04	66.3	.....	91	22	77	40	27	56	35	61	58	79	1.06	−2.1	6	7.0	s.	23	w.	23	18	6	7	4.0	.0	.0	1
Concord[2]	289	4	45	29.72	30.03	+.05	66.4	−.4	90	22	79	33	25	54	42	61	58	79	.95	−2.6	4	5.7	nw.	21	nw.	3	15	11	5	3.9	.0	.0	1
Burlington[2]	403	11	48	29.58	30.01	+.04	66.6	−1.3	86	22	76	39	25	57	30	62	59	78	4.19	+.8	9	6.8	s.	25	se.	16	6	13	12	6.1	.0	.0	3
Northfield	876	12	60	29.10	30.04	+.06	64.2	+.8	86	21	76	33	25	52	38	...	...	...	1.34	−2.2	12	6.2	sw.	21	s.	16	8	13	10	6.1	.0	.0	2
Boston[1]	124	33	62	29.90	30.03	+.04	70.7	.....	92	21	78	50	26	63	23	63	58	69	2.09	−1.5	7	9.5	sw.	25	se.	9	8	11	12	5.7	.0	.0	1
Nantucket	12	10	63	30.04	30.05	+.06	68.6	+.8	85	21	75	54	27	62	21	64	62	84	7.12	+3.7	7	10.1	sw.	26	ne.	30	8	10	13	6.0	.0	.0	0
Block Island	26	11	46	30.02	30.05	+.06	68.6	+.1	81	21	74	54	31	63	19	64	62	83	5.70	+2.0	8	11.7	sw.	30	ne.	24	17	8	6	3.8	.0	.0	3
Providence[2]	159	46	60	29.88	30.05	+.06	71.5	+.5	93	22	80	48	31	63	30	63	60	79	4.54	+1.0	8	7.1	sw.	24	sw.	16	9	12	10	5.7	.0	.0	1
Hartford[1]	159	5	44	29.87	30.04	+.05	69.9	.....	89	22	80	46	25	60	32	64	61	80	4.31	+.0	10	6.7	sw.	21	s.	10	8	10	13	6.0	.0	.0	5
New Haven[2]	107	74	153	29.94	30.06	+.07	70.9	+.6	90	21	79	49	25	63	24	65	63	81	10.14	+5.9	11	7.2	s.	22	n.	23	12	12	7	4.9	.0	.0	6
Middle Atlantic States							**73.3**	**−0.2**										**79**	**6.56**	**+2.3**										**6.3**			
Albany[1]	97	26	40	29.92	30.03	+.05	68.8	+.2	90	21	79	40	26	58	35	63	60	77	.66	−2.4	6	6.6	s.	26	s.	16	5	14	12	6.4	.0	.0	3
Binghamton	871	57	79	29.15	30.07	+.08	68.4	+.4	92	21	79	42	26	58	34	61	58	77	1.09	−2.5	11	4.8	w.	18	w.	16	4	15	12	6.7	.0	.0	3
New York	314	415	454	29.71	30.04	+.04	72.8	−.3	89	21	79	56	25	66	20	65	61	72	7.01	+2.7	11	11.3	n.	43	nw.	16	10	9	12	5.8	.0	.0	7
Harrisburg[1]	374	30	49	29.66	30.05	+.04	72.1	−.5	94	15	82	48	25	63	29	66	64	81	4.60	+.6	11	5.5	w.	27	sw.	15	5	11	15	6.6	.0	.0	8
Philadelphia[2]	114	174	367	29.93	30.06	+.06	74.1	−.7	92	1	82	55	25	67	22	67	64	79	6.55	+1.9	9	9.8	sw.	37	sw.	16	8	11	12	6.1	.0	.0	7
Reading	323	47	306	29.71	30.05	.....	72.4	−.5	92	15	82	49	25	63	28	...	...	...	7.75	+3.5	12	7.8	sw.	32	e.	8	8	8	15	6.1	.0	.0	5
Scranton	805	72	104	29.21	30.06	+.06	69.3	−.5	90	16	79	44	25	59	32	...	...	...	1.66	−2.0	8	5.2	n.	24	nw.	24	9	13	9	5.4	.0	.0	3
Atlantic City	52	37	172	29.99	30.04	+.04	73.4	+.9	90	2	79	54	25	68	28	68	65	79	9.95	+5.5	14	13.0	s.	37	se.	9	7	12	12	6.4	.0	.0	10
Trenton	190	89	107	29.85	30.05	.....	72.7	−.3	90	1	81	52	25	64	23	66	64	77	4.69	−.1	9	6.4	s.	28	sw.	16	5	11	15	6.3	.0	.0	3
Baltimore[2]	123	100	215	29.92	30.05	+.04	75.4	−.1	94	1	83	54	26	68	22	68	65	77	7.01	+2.6	13	8.6	s.	34	se.	8	8	7	16	6.3	.0	.0	7
Washington[1]	112	62	85	29.99	30.06	+.05	75.0	.0	93	2	83	51	26	67	26	68	66	80	9.49	+5.5	12	5.5	s.	19	w.	17	5	15	11	6.3	.0	.0	7
Cape Henry	18	8	54	30.02	30.04	.....	77.2	+.3	95	3	83	64	28	71	23	71	69	80	6.30	+1.4	18	10.4	sw.	52	nw.	3	3	18	10	6.3	.0	.0	10
Lynchburg	686	144	184	29.34	30.05	+.03	75.0	−.6	101	2	84	48	26	66	32	68	66	81	10.36	+6.6	18	5.8	w.	22	sw.	23	6	8	17	6.6	.0	.0	11
Norfolk[2]	91	80	125	29.96	30.06	+.06	77.6	+.2	101	3	84	64	26	71	27	70	68	81	15.61	+10.4	17	8.9	sw.	37	n.	11	1	14	16	7.5	.0	.0	8
Richmond[2]	144	11	52	29.90	30.05	+.04	75.4	−1.1	98	3	84	52	26	67	28	69	68	87	5.73	+1.3	19	6.5	sw.	38	n.	3	7	11	13	6.2	.0	.0	10
South Atlantic States							**78.5**	**+0.4**										**82**	**4.89**	**−0.8**										**5.8**			
Asheville	2,253	89	104	27.78	30.07	+.05	71.8	+1.3	93	2	82	51	27	62	31	65	63	86	3.89	−.3	16	5.5	nw.	26	e.	30	2	10	19	7.4	.0	.0	9
Charlotte[2]	779	63	86	29.24	30.05	+.03	77.8	+.7	98	2	87	55	26	69	25	70	67	81	3.48	−1.6	13	6.2	sw.	24	sw.	23	5	13	13	6.8	.0	.0	7
Greensboro[1]	886	6	56	29.14	30.07	.....	75.1	.....	98	2	84	49	26	66	30	68	67	84	5.53	.....	16	7.0	sw.	25	sw.	23	5	10	16	6.8	.0	.0	12
Hatteras	11	5	50	30.04	30.05	+.05	78.0	.0	90	2	83	66	29	73	16	73	72	85	6.35	+.6	14	12.7	sw.	36	n.	6	8	9	14	6.1	.0	.0	12
Raleigh[1]	376	27	69	29.66	30.06	+.05	77.6	+.7	101	2	87	54	26	68	29	70	68	84	7.03	+1.6	15	7.3	sw.	42	nw.	11	6	9	16	6.7	.0	.0	15
Wilmington	72	73	107	29.98	30.06	+.06	78.2	+.6	95	1	86	60	26	71	24	72	70	81	10.02	+3.7	15	8.8	sw.	32	nw.	1	8	18	5	5.0	.0	.0	13
Charleston[2]	48	11	92	30.00	30.05	+.04	80.8	−.2	98	4	87	63	26	74	23	73	71	84	4.65	−1.9	9	10.1	s.	29	nw.	9	16	10	5	4.4	.0	.0	6
Columbia, S. C.[2]	347	70	91	29.68	30.05	+.04	79.2	−.4	100	1	88	58	26	70	26	72	70	82	4.68	−.8	12	7.7	s.	30	s.	18	9	9	13	5.9	.0	.0	13
Greenville, S. C.[1]	1,040	70	78	28.98	30.06	.....	76.2	+.4	96	2	85	56	26	68	25	69	67	81	4.87	−.6	16	7.0	sw.	26	n.	3	5	11	15	4.9	.0	.0	13
Augusta[2]	182	62	77	29.86	30.05	+.04	80.4	.0	98	1	90	59	26	71	24	71	68	76	3.12	−1.9	12	5.5	s.	25	sw.	20	9	12	10	5.5	.0	.0	8
Savannah[2]	65	73	152	29.99	30.05	+.04	81.8	+1.1	96	4	90	63	26	73	22	73	71	81	2.48	−4.8	9	9.0	s.	38	w.	5	12	12	7	4.9	.0	.0	9
Jacksonville[2]	43	36	110	30.01	30.06	+.05	81.9	+.2	96	4	90	69	31	74	22	74	72	80	3.22	−2.6	13	7.3	se.	24	w.	18	5	19	7	5.6	.0	.0	12
Florida Peninsula							**83.9**	**+1.8**										**81**	**3.08**	**−3.2**										**5.6**			
Key West[2]	21	10	64	29.98	30.00	+.02	84.8	+1.3	92	12	90	76	31	80	14	78	76	79	1.53	−3.0	14	10.2	e.	27	se.	17	5	21	5	5.4	.0	.0	9
Miami[2]	25	124	168	29.99	30.02	.00	83.3	+1.9	90	9	88	69	30	78	19	76	74	82	3.36	−2.8	14	7.8	e.	36	s.	17	7	15	9	5.8	.0	.0	11
Tampa[1]	35	5	61	30.00	30.04	+.04	83.6	+2.1	95	25	92	73	25	76	22	75	74	82	4.34	−3.8	19	8.9	e.	40	s.	18	2	24	5	5.7	.0	.0	20
East Gulf States							**80.1**	**0.0**										**83**	**5.77**	**+0.5**										**6.1**			
Atlanta[1]	1,173	5	72	28.85	30.05	+.04	77.7	+.3	97	2	87	58	26	68	27	69	67	81	5.53	+.8	16	7.2	sw.	26	w.	4	4	15	12	6.1	.0	.0	16
Macon[2]	370	79	87	29.66	30.05	+.04	79.4	−.5	97	1	89	61	28	70	26	71	69	81	5.98	+1.6	10	6.1	s.	22	s.	1	5	14	12	6.1	.0	.0	10
Thomasville	273	49	58	29.78	30.07	+.07	80.3	−.7	95	29	90	64	27	70	27	...	...	...	4.29	−1.5	13	.....	...	...	...	...	2	13	16	...	.0	.0	12
Apalachicola	35	11	51	29.99	30.03	.....	82.2	+1.0	92	5	88	68	31	76	18	76	74	81	5.97	−1.6	14	8.0	se.	27	n.	6	8	12	11	6.0	.0	.0	21
Pensacola	56	54	79	29.98	30.04	+.06	81.6	+.7	94	24	88	70	27	75	21	75	73	82	7.79	−.2	16	6.9	w.	25	sw.	17	4	16	11	6.3	.0	.0	15
Anniston	741	9	...	.....	.....	.....	76.8	+.4	95	16	87	56	25	66	31	...	...	...	8.62	+4.6	11	.....	se.	...	...	...	4	21	6	...	.0	.0	7
Birmingham[2]	700	11	48	29.32	30.05	+.06	78.8	−.4	95	16	89	60	27	69	27	70	68	81	2.08	−2.2	11	6.0	s.	16	se.	16	7	14	10	5.8	.0	.0	13
Mobile[2]	57	6	30	29.98	30.04	+.06	81.8	+.8	96	6	90	67	27	74	21	74	73	87	6.54	−.4	12	5.7	e.	20	sw.	6	0	23	8	6.4	.0	.0	10
Montgomery[2]	218	92	105	29.82	30.04	+.05	79.6	−1.2	94	15	88	65	27	71	23	72	70	82	4.00	−.2	10	6.2	e.	24	nw.	5	6	14	11	6.0	.0	.0	11
Meridian[2]	375	67	92	29.65	30.04	+.06	79.4	−.1	95	15	88	64	27	70	25	72	71	83	5.54	+1.0	14	5.5	e.	20	se.	3	6	17	8	5.6	.0	.0	9
Vicksburg[2]	247	82	102	29.76	30.02	+.04	81.0	+.2	93	1	89	69	25	73	20	73	71	85	2.05	−1.4	11	7.4	e.	23	sw.	10	4	14	13	6.4	.0	.0	11
New Orleans[2]	53	76	84	29.96	30.01	+.03	82.8	+.6	95	7	90	72	31	76	19	75	73	84	10.87	+5.1	19	5.4	se.	20	ne.	9	4	17	10	6.4	.0	.0	20
West Gulf States							**82.0**	**+0.1**										**77**	**4.72**	**+1.3**										**5.8**			
Shreveport[1]	249	92	227	29.72	29.98	+.01	82.6	+.9	101	1	91	68	1?	74	25	74	72	78	7.99	+5.3	15	8.4	se.	33	se.	22	7	12	12	6.2	.0	.0	12
Bentonville	1,303	12	51	28.64	29.98	+.01	75.5	−1.0	98	2	86	56	24	65	28	...	...	...	4.68	+.6	10	5.0	s.	21	ne.	10	3	21	7	...	.0	.0	7
Fort Smith	463	57	82	29.49	29.96	−.01	80.4	−.1	99	2	90	65	9	71	27	71	68	72	3.46	+.2	9	6.4	e.	47	n.	9	8	15	8	5.5	.0	.0	5
Little Rock[2]	357	94	102	29.63	30.00	+.02	79.4	−.4	101	1	89	62	25	70	26	72	70	81	5.09	+1.3	11	6.9	e.	32	n.	9	4	16	11	6.3	.0	.0	9
Austin[2]	605	68	90	29.31	29.94	.....	82.7	−1.1	98	8	93	68	29	73	26	74	71	76	2.16	+.1	6	8.9	s.	36	ne.	30	9	18	4	4.9	.0	.0	8
Brownsville[2]	57	88	96	29.84	29.90	.....	83.6	−.3	95	27	92	73	29	76	20	76	73	79	2.64	.....	10	9.0	se.	27	se.	14	4	17	10	6.3	.0	.0	3
Corpus Christi[2]	20	11	78	29.91	29.93	.00	84.6	+2.1	95	21	91	69	30	78	19	76	75	84	5.48	+3.2	7	10.9	s.	61	w.	30	14	13	4	4.5	.0	.0	3
Dallas[1]	512	6	46	29.41	29.95	.....	84.3	.....	104	9	94	68	29	75	25	74	70	68	2.72	.0	9	10.2	se.	27	e.	30	10	13	8	5.5	.0	.0	6
Fort Worth[1]	679	35	56	29.25	29.94	.00	84.4	+1.7	106	9	95	68	29	74	31	73	69	68	4.69	+2.1	9	10.3	s.	31	nw.	11	3	21	7	5.7	.0	.0	7
Galveston[2]	54	106	114	29.90	29.95	−.01	83.8	+.8	91	17	88	73	21	80	13	77	75	78	5.56	+1.3	12	10.8	s.	50	se.	30	1	21	9	6.2	.0	.0	10
Houston[2]	138	157	190	29.81	29.95	.....	82.8	−.4	94	9	90	72	29	76	18	76	74	84	4.08	−.1	15	9.2	se.	35	se.	30	0	19	12	7.1	.0	.0	13
Palestine	510	64	72	29.46	29.98	+.01	81.7	−.1	95	9	91	70	11	73	24	73	71	76	3.05	−.9	12	6.9	s.	26	se.	14	11	11	9	4.9	.0	.0	9
Port Arthur	34	59	134	29.93	29.97	.....	83.8	.....	95	19	90	72	29	77	20	76	74	79	10.50	+4.5	14	12.2	s.	66	se.	21	2	20	9	6.4	.0	.0	21
San Antonio[1]	693	28	59	29.21	29.92	−.01	82.7	−.8	96	9	92	66	29	73	27	73	70	74	1.88	−.5	5	7.7	se.	63	ne.	30	2	20	9	6.4	.0	.0	3

See footnotes at end of table.

CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS—Continued

District and station	Elevation of instruments: Barometer above sea level	Elevation of instruments: Thermometer above ground	Elevation of instruments: Anemometer above ground	Pressure: Station, reduced to mean of 24 hours	Pressure: Sea level, reduced to mean of 24 hours	Pressure: Departure from normal	Temperature of the air: Mean max. + mean min. ÷ 2	Temperature of the air: Departure from normal	Temperature of the air: Maximum	Temperature of the air: Date	Temperature of the air: Mean maximum	Temperature of the air: Minimum	Temperature of the air: Date	Temperature of the air: Mean minimum	Temperature of the air: Greatest daily range	Mean wet thermometer	Mean temperature of the dewpoint	Mean relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Days with 0.01 inch or more	Wind: Average hourly velocity	Wind: Prevailing direction	Wind: Maximum velocity: Miles per hour	Wind: Maximum velocity: Direction	Wind: Maximum velocity: Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month	Number of days with thunderstorms
Ohio Valley and Tennessee	*Ft.*	*Ft.*	*Ft.*	*In.*	*In.*	*In.*	*°F.*	*°F.*	*°F.*		*°F.*	*°F.*		*°F.*	*°F.*	*°F.*	*°F.*	*%*	*In.*	*In.*		*Miles*								*0–10*	*In.*	*In.*	
							74.1	−0.3										81	5.07	+1.6										5.9			
Chattanooga [1]	762	21	54	29.25	30.05	+.05	76.0	+.3	95	1	86	53	27	66	33	70	68	85	3.96	−.1	12	4.3	s.	23	n.	3	7	11	13	6.1	.0	.0	9
Knoxville [2]	995	66	84	29.02	30.05	+.04	75.0	−1.2	97	2	85	55	27	65	27	68	66	83	8.88	+5.0	14	6.0	ne.	33	sw.	23	8	11	12	6.1	.0	.0	11
Memphis [2]	399	78	86	29.59	30.00	+.02	78.6	−.8	100	2	88	59	25	69	28	71	69	78	4.90	+1.5	11	6.3	sw.	35	n.	7	10	13	8	5.3	.0	.0	9
Nashville [1]	546	5	72	29.45	30.03	+.03	77.0	.....	99	1	87	53	25	67	30	70	68	81	8.31	+4.6	13	5.9	s.	29	w.	4	6	14	11	6.0	.0	.0	12
Lexington	989	6	.....	29.05	30.10	+.09	75.0	+.5	98	2	86	48	25	64	32	.....	.....	.....	7.26	+3.8	12	.....	s.	.....	.....	.....	13	8	10	4.8	.0	.0	7
Louisville [2]	525	106	120	29.47	30.03	+.03	76.2	−.8	98	2	85	53	25	68	25	68	66	79	6.10	+2.7	7	7.0	sw.	27	sw.	22	6	20	5	5.6	.0	.0	2
Evansville [1]	431	5	38	29.56	30.02	+.03	75.3	+.3	99	1	86	49	25	65	29	68	66	78	2.69	−.7	9	6.1	n.	19	sw.	22	9	12	10	5.6	.0	.0	3
Indianapolis [2]	823	98	129	29.16	30.03	+.03	74.1	+.4	96	2	83	50	25	65	27	66	64	81	2.98	−.3	11	6.5	s.	23	sw.	22	9	11	11	5.9	.0	.0	6
Terre Haute [2]	575	68	149	29.42	30.03	.....	74.8	.....	94	2	84	50	25	66	27	68	65	80	1.32	−1.9	7	7.3	sw.	24	ne.	1	5	15	11	6.2	.0	.0	4
Cincinnati [2]	627	11	51	29.37	30.04	+.03	73.5	−.1	93	2	83	48	25	64	27	67	65	82	5.56	+2.2	12	5.4	sw.	24	sw.	9	7	12	12	5.7	.0	.0	8
Columbus [2]	822	90	110	29.18	30.04	+.03	73.2	+.2	92	2	82	52	25	64	26	65	62	79	2.97	−.3	11	7.2	n.	36	sw.	22	8	5	18	6.4	.0	.0	3
Dayton [2]	900	186	213	29.10	30.05	.....	72.9	−.5	91	1	81	49	25	64	27	65	54	80	2.78	−.5	9	7.5	n.	31	nw.	2	7	11	13	5.7	.0	.0	5
Elkins [2]	1,947	61	78	28.07	30.08	+.06	69.0	−.1	87	2	78	44	26	59	35	63	62	92	9.35	+5.5	15	4.3	e.	15	nw.	17	4	8	19	7.2	.0	.0	8
Parkersburg	637	77	84	29.37	30.04	+.03	73.3	−.6	94	2	83	50	25	64	28	67	65	82	6.15	+2.6	12	3.9	se.	20	w.	16	6	18	7	5.5	.0	.0	9
Pittsburgh [1]	842	39	54	29.16	30.05	+.04	70.7	−1.1	89	15	80	47	25	62	26	64	61	80	2.77	−.5	12	7.8	s.	31	sw.	2	3	12	16	6.7	.0	.0	8
Lower Lake Region							68.6	+0.2										78	3.08	0.0									5.7			
Buffalo [2]	768	243	280	29.23	30.04	+.05	67.8	−.8	82	30	74	51	25	62	22	62	59	77	2.45	−.6	9	12.3	sw.	44	w.	22	10	9	12	5.5	.0	.0	7
Canton	448	10	61	29.54	30.00	.....	66.9	+.3	85	15	77	37	25	56	36	61	58	75	2.91	−.7	7	6.7	sw.	28	w.	20	3	12	16	6.9	.0	.0	4
Ithaca	836	77	100	.....	.....	.....	67.6	−1.0	89	15	79	42	25	56	34	.....	.....	.....	4.68	+1.3	10	6.2	nw.	22	se.	8	4	13	14	6.7	.0	.0	5
Oswego	335	71	85	29.66	30.02	+.03	68.4	.0	88	15	76	48	25	61	25	62	60	76	1.41	−1.2	11	7.3	s.	24	n.	24	12	12	7	4.8	.0	.0	3
Rochester [1]	523	5	69	29.48	30.04	+.05	69.2	+1.3	91	15	79	43	25	59	31	62	59	77	1.66	−1.2	9	7.8	sw.	30	w.	2	8	8	15	6.3	.0	.0	5
Syracuse [1]	596	5	51	29.40	30.04	+.05	68.6	+1.3	90	21	80	44	25	58	35	62	60	78	2.40	−.5	13	8.2	sw.	25	sw.	23	7	14	10	6.1	.0	.0	6
Erie [2]	714	57	81	29.29	30.05	+.04	70.2	+.6	88	22	77	48	25	63	23	63	61	81	2.87	−.4	7	7.0	sw.	24	w.	22	9	16	6	5.3	.0	.0	0
Cleveland [1]	762	27	54	29.23	30.04	+.03	71.0	+.8	88	22	81	50	25	61	30	64	61	78	3.50	+.7	10	7.6	s.	31	sw.	15	7	13	11	6.0	.0	.0	.5
Sandusky	629	5	67	.....	.....	.....	72.2	+.4	89	22	81	49	25	64	27	.....	.....	.....	3.30	+.1	11	6.9	sw.	30	sw.	22	7	13	11	5.5	.0	.0	6
Toledo [2]	628	79	87	29.37	30.05	+.05	70.4	−.9	87	22	78	47	24	62	22	65	63	84	3.81	+1.0	10	7.5	w.	27	w.	9	14	14	3	3.9	.0	.0	7
Fort Wayne [1]	857	69	84	29.13	30.04	.....	70.0	−.9	85	20	80	45	24	60	27	64	62	82	3.86	+.8	7	5.7	sw.	26	nw.	22	9	5	17	6.1	.0	.0	6
Detroit [1]	730	5	78	29.27	30.04	+.03	70.6	+1.4	88	20	80	48	25	62	24	64	61	76	4.12	+1.3	10	7.6	sw.	34	w.	22	9	12	10	5.7	.0	.0	5
Upper Lake Region							67.3	+1.1										78	2.78	−0.1									5.8			
Alpena	609	5	89	29.36	30.02	+.02	66.4	+2.3	92	21	75	46	24	58	32	61	58	77	1.22	−1.6	6	9.4	nw.	30	w.	22	10	12	9	5.5	.0	.0	2
Escanaba	612	51	72	.....	30.00	+.01	65.4	+1.1	87	20	73	40	24	58	.....	.....	.....	81	1.61	−1.6	6	9.9	s.	27	nw.	22	8	9	14	.....	.0	.0	1
Grand Rapids [2]	707	70	244	29.26	30.01	+.01	71.0	+1.3	91	31	80	48	24	62	27	64	61	79	3.64	+1.0	10	9.1	s.	43	sw.	14	13	13	5	4.5	.0	.0	9
Lansing [2]	878	5	90	29.10	30.04	.....	67.8	−.7	86	21	77	44	24	59	24	63	60	78	2.36	−.5	9	6.5	s.	21	sw.	22	10	10	11	5.4	.0	.0	7
Marquette	734	44	73	29.18	29.97	−.01	65.9	+2.1	99	21	74	45	24	58	33	59	56	75	3.22	+.6	11	8.5	s.	30	s.	25	9	11	11	5.9	.0	.0	3
Sault Sainte Marie [1]	614	11	43	29.33	30.00	+.01	63.0	+.9	90	21	74	38	24	52	36	58	55	81	2.53	−.2	7	9.8	e.	41	w.	22	7	8	16	6.5	.0	.0	4
Chicago	673	7	131	29.30	30.02	+.02	72.3	+.7	93	21	82	48	25	62	27	64	61	76	3.61	+.6	11	7.3	sw.	34	nw.	22	11	7	13	5.4	.0	.0	9
Green Bay	617	109	141	29.34	30.01	+.02	68.0	+.3	92	21	77	44	24	59	26	62	58	74	1.11	−2.1	9	9.3	s.	26	nw.	22	3	14	14	7.1	.0	.0	3
Milwaukee [1]	681	33	66	29.28	30.01	+.01	69.2	+1.6	91	21	78	48	24	60	26	63	61	79	4.14	+1.5	8	10.0	sw.	33	sw.	22	12	8	11	5.4	.0	.0	6
Duluth	1,133	5	47	28.74	29.95	−.02	64.4	+1.8	89	21	73	40	24	56	26	59	56	82	4.35	+1.2	10	10.2	ne.	33	w.	22	8	11	12	6.1	.0	.0	
North Dakota							67.1	+1.2										72	3.26	+1.1									5.1			
Fargo [1]	940	5	43	28.90	29.90	−.06	68.4	+2.3	94	20	80	38	23	57	39	61	58	75	6.71	+3.8	12	12.2	nw.	49	w.	4	7	13	11	5.8	.0	.0	10
Bismarck [1]	1,677	4	41	28.16	29.91	−.03	68.0	+1.3	99	20	81	38	23	55	36	59	55	69	1.17	−.6	10	9.4	nw.	34	nw.	14	15	7	9	4.6	.0	.0	8
Devils Lake	1,478	11	44	28.35	29.90	−.04	65.2	+.4	94	20	76	42	23	54	36	59	57	81	3.36	+.9	13	7.6	nw.	27	e.	29	7	9	15	6.2	.0	.0	7
Lemmon, S. Dak.	2,602	4	38	27.25	29.93	.....	67.7	.....	102	20	80	42	23	55	43	58	53	68	2.46	.....	.....	.....	s.	.....	.....	.....	13	8	10	.....	.0	.0	11
Grand Forks	832	11	71	29.01	29.90	.....	65.6	.....	95	20	77	35	23	54	41	60	57	.....	3.91	.....	16	.....	nw.	.....	.....	.....	13	10	8	.....	.0	.0	6
Williston	1,878	42	50	27.97	29.91	−.02	66.9	+.8	101	20	80	39	23	54	38	57	51	65	1.79	+.3	9	6.3	se.	24	se.	27	14	12	5	3.9	.0	.0	7
Upper Mississippi Valley							73.3	+0.3										76	2.67	−0.6									5.1			
Minneapolis-St. Paul, Minn. [1]	919	32	61	28.97	29.94	−.03	70.5	.....	92	21	80	44	24	61	29	63	60	74	2.11	−1.0	10	9.1	s	29	se	1	8	12	11	5.6	.0	.0	4
Springfield, Minn.	1,025	4	42	28.86	29.94	.....	71.7	.....	95	21	82	45	24	61	30	64	60	72	3.38	.....	6	.....	s.	.....	.....	.....	15	8	8	.....	.0	.0	5
La Crosse [2]	714	11	48	29.21	29.97	−.01	70.2	+.2	91	21	80	44	24	61	26	64	61	78	3.18	−.5	9	4.5	s.	13	s.	25	9	10	12	5.8	.0	.0	8
Madison [2]	974	70	78	28.98	30.01	+.02	70.0	+.2	89	31	78	50	24	62	22	63	60	77	1.95	−1.3	8	6.7	s.	22	sw.	22	7	11	13	6.0	.0	.0	5
Charles City	1,015	10	51	28.92	30.00	+.03	70.0	+.9	90	21	80	42	24	60	27	64	62	79	3.34	−.1	10	5.5	s.	18	sw.	18	15	12	4	4.1	.0	.0	10
Davenport [2]	606	66	161	29.36	30.02	+.04	73.8	+.7	95	1	83	50	24	65	26	66	62	76	2.66	−.8	9	7.6	sw.	28	nw.	27	10	11	10	5.2	.0	.0	9
Des Moines [2]	860	5	99	29.06	29.97	.00	73.9	+.8	95	1	84	47	24	64	27	66	63	77	2.53	−1.0	6	7.9	s.	33	sw.	27	12	13	6	4.5	.0	.0	5
Dubuque	699	60	79	29.26	30.00	+.02	72.0	+.3	92	21	81	47	24	63	27	65	62	76	2.80	−.4	10	5.0	s.	20	n.	7	9	8	14	5.8	.0	.0	6
Burlington, Iowa [1]	702	6	35	29.26	30.00	+.02	73.8	−.5	97	1	85	50	24	63	29	65	62	76	1.80	−1.8	6	7.2	s.	20	sw.	21	12	14	5	4.4	.0	.0	6
Cairo	358	87	93	29.64	30.02	+.03	77.4	−.4	100	1	86	56	25	69	24	.....	.....	.....	5.05	+2.0	13	5.9	s.	32	n.	6	7	12	12	5.8	.0	.0	8
Peoria [2]	609	11	45	29.38	30.02	+.03	73.4	+.9	97	1	84	45	24	63	29	61	63	78	2.13	−1.0	6	3.8	s.	14	sw.	22	18	11	2	3.7	.0	.0	4
Springfield, Ill. [2]	636	5	191	29.34	30.02	+.03	75.5	+1.0	98	1	85	51	25	66	25	66	64	81	.91	−2.3	7	8.9	s.	23	sw.	22	12	7	12	5.4	.0	.0	9
St. Louis [2]	568	179	303	29.42	30.02	+.03	76.8	−.7	98	2	84	56	25	69	21	68	63	67	3.60	+.6	6	9.4	sw.	24	s.	26	15	7	9	4.5	.0	.0	5
Missouri Valley							74.8	+1.3										74	3.52	+0.1									4.7			
Columbia, Mo. [2]	784	6	66	29.17	29.99	+.02	75.4	−.2	98	1	85	54	24	66	25	68	65	79	3.73	+.1	9	5.6	s.	21	nw.	6	11	14	6	4.4	.0	.0	8
Kansas City [1]	963	38	76	28.97	29.97	.00	76.8	.....	97	1	85	58	23	68	23	69	65	72	5.80	+1.7	9	8.7	sw.	37	nw.	6	14	7	10	4.9	.0	.0	7
St. Joseph [2]	967	11	49	28.98	29.98	.....	75.5	−1.0	99	1	84	56	23	66	23	69	67	83	4.76	+.9	12	7.0	s.	20	n.	5	14	7	10	4.7	.0	.0	9
Springfield, Mo. [1]	1,324	5	60	28.63	30.01	+.04	74.7	.....	95	2	84	55	24	65	27	68	65	80	2.91	−1.2	12	7.9	se.	28	nw.	8	8	13	10	5.7	.0	.0	8
Topeka	987	65	87	28.94	29.97	.....	77.2	+1.0	103	1	87	60	23	68	28	69	65	75	7.72	+3.6	10	7.3	s.	24	s.	26	13	7	11	4.8	.0	.0	10
Lincoln [2]	1,189	11	81	28.69	29.92	−.03	76.8	+2.4	104	1	87	52	23	67	29	67	63	70	2.55	−1.0	9	8.5	s.	28	n.	2	11	15	5	4.5	.0	.0	4
Omaha [1]	1,105	31	44	28.81	29.96	.00	75.4	+2.2	102	1	85	52	23	66	31	67	64	72	3.25	+.2	7	10.1	s.	34	w.	5	11	11	9	5.2	.0	.0	4
Valentine	2,598	46	54	27.27	29.93	−.01	72.8	+1.1	98	19	86	47	23	60	37	61	55	61	1.27	−.9	5	8.9	s.	31	sw.	24	12	14	5	4.5	.0	.0	8
Sioux City [1]	1,138	5	27	28.75	29.94	−.01	73.8	+2.7	98	21	85	50	23	62	36	65	62	72	1.56	−1.6	4	7.9	se.	25	s.	30	12	15	4	4.3	.0	.0	8
Huron [1]	1,301	5	41	28.55	29.92	−.03	71.4	+2.0	96	20	84	42	23	59	38	64	61	75	1.61	−.8	6	11.4	s.	37	se.	24	11	16	4	4.2	.0	.0	7

See footnotes at end of table.

CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS—Continued

District and station	Elevation of instruments: Barometer above sea level	Elevation of instruments: Thermometer above ground	Elevation of instruments: Anemometer above ground	Pressure: Station, reduced to mean of 24 hours	Pressure: Sea level, reduced to mean of 24 hours	Pressure: Departure from normal	Temperature of the air: Mean max. + mean min. ÷2	Temperature of the air: Departure from normal	Temperature of the air: Maximum	Temperature of the air: Date	Temperature of the air: Mean maximum	Temperature of the air: Minimum	Temperature of the air: Date	Temperature of the air: Mean minimum	Temperature of the air: Greatest daily range	Mean wet thermometer	Mean temperature of the dewpoint	Mean relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Days with 0.01 inch or more	Wind: Average hourly velocity	Wind: Prevailing direction	Wind: Maximum velocity: Miles per hour	Wind: Maximum velocity: Direction	Wind: Maximum velocity: Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month	Number of days with thunderstorms
	Ft.	*Ft.*	*Ft.*	*In.*	*In.*	*In.*	° *F.*	° *F.*	°*F.*		°*F.*	°*F.*		°*F.*	°*F.*	°*F.*	°*F.*	%	*In.*	*In.*		*Miles*								*0–10*	*In.*	*In.*	
Northern Slope							68.7	+1.6										55	0.82	−0.3										4.0			
Billings [1]	3,570	18	39	26.33	29.91	.....	68.4	−2.2	96	19	82	48	23	55	38	56	47	52	1.07	+.2	6	9.8	sw.	50	n.	21	11	16	4	4.5	.0	.0	9
Havre	2,507	11	67	27.35	29.94	+.03	67.4	+2.0	98	19	82	42	22	53	42	55	48	58	.78	−.4	7	6.2	ne.	29	nw.	12	16	8	7	4.2	.0	.0	4
Helena [1]	4,124	5	35	25.83	29.95	+.01	65.8	+1.2	97	19	82	39	13	49	50	52	42	50	.60	−.2	7	8.0	w.	46	w.	23	15	12	4	4.1	.0	.0	9
Missoula [2]	3,205	80	91	26.64	29.95	.....	69.0	+3.4	99	10	84	43	13	53	43	54	43	50	.64	−.3	5	6.5	w.	34	e.	21	21	6	4	2.8	.0	.0	6
Kalispell	2,973	48	56	26.92	29.92	−.01	64.6	+1.8	92	18	79	39	13	50	40	54	46	58	.90	.0	4	5.8	w.	20	w.	24	19	7	5	3.4	.0	.0	2
Miles City [2]	2,371	48	55	27.47	29.91	−.02	70.4	+1.1	99	20	83	46	23	57	40	58	51	60	1.16	+.1	8	5.4	ne.	28	n.	21	15	11	5	4.0	.0	.0	4
Rapid City [2]	3,259	50	58	26.63	29.91	−.02	70.4	+.9	100	20	84	46	23	57	41	58	51	55	.24	−1.5	3	12.	7 s.	45	nw.	13	13	14	4	4.0	.0	.0	13
Cheyenne [1]	6,094	5	39	24.09	29.93	+.01	65.6	.....	87	21	80	43	23	51	37	53	46	59	2.06	+.5	11	8.2	s.	42	nw.	7	7	17	7	5.2	.0	.0	11
Lander	5,352	60	68	24.71	29.90	−.02	67.7	+2.2	92	21	84	44	14	51	43	52	41	46	.08	−.4	4	5.1	sw.	32	sw.	4	14	14	3	3.8	.0	.0	7
Sheridan [2]	3,790	6	42	26.12	29.91	.....	69.2	+2.7	99	11	85	45	16	53	45	54	43	48	.12	−.8	6	7.6	nw.	36	nw.	5	14	13	4	4.1	.0	.0	9
North Platte [2]	2,821	11	51	27.05	29.91	−.03	73.8	+3.0	96	5	85	52	15	62	35	63	59	69	1.40	−1.0	7	7.1	s.	30	ne.	6	13	16	2	4.1	.0	.0	7
Middle Slope							75.7	−0.1										66	2.98	+0.5										4.9			
Denver [1]	5,292	106	113	24.79	29.89	−.03	71.7	+2.0	92	29	84	51	23	60	35	55	46	49	.39	−1.0	3	7.1	s.	26	n.	4	11	14	6	4.8	.0	.0	6
Pueblo [1]	4,690	5	36	25.32	29.89	−.02	72.0	−.7	96	1	87	50	23	57	38	59	52	62	1.58	−.2	9	7.5	nw.	40	sw.	17	12	14	5	4.6	.0	.0	12
Concordia	1,392	50	58	28.52	29.95	.00	76.6	+.1	103	1	86	56	23	67	25	68	64	70	4.61	+1.7	7	7.7	s.	34	nw.	7	8	15	8	5.3	.0	.0	11
Dodge City [1]	2,509	10	86	27.39	29.92	−.01	76.5	−1.2	101	1	89	55	23	64	33	66	61	68	1.89	−.8	11	14.2	s.	53	n.	7	10	13	8	5.3	.0	.0	12
Wichita [1]	1,358	6	64	28.55	29.95	.00	77.2	−1.1	101	2	87	56	24	67	27	68	65	75	4.51	+1.4	10	12.4	s.	33	s.	26	15	8	8	4.5	.0	.0	7
Oklahoma City [2]	1,214	10	47	28.69	29.94	.00	80.0	+.3	100	2	90	62	17	70	26	70	67	71	4.87	+2.0	11	7.5	s.	31	nw.	10	10	13	8	5.0	.0	.0	9
Southern Slope							79.9	+0.3										66	3.50	+1.2										5.3			
Abilene [2]	1,738	10	56	28.15	29.90	−.02	83.0	+1.0	103	10	94	68	23	72	29	70	66	68	3.52	+1.3	8	9.2	s.	24	e.	21	7	15	9	5.7	.0	.0	5
Amarillo [2]	3,676	10	49	26.30	29.92	.00	75.4	−.3	96	6	87	55	23	64	32	65	61	70	3.95	+.9	11	13.4	s.	43	e.	10	10	14	7	5.0	.0	.0	9
Del Rio	960	63	71	28.90	29.86	−.04	84.6	+.4	100	10	94	70	30	76	24	72	67	62	2.92	+1.2	6	10.6	se.	34	w.	30	9	14	8	5.6	.0	.0	4
Roswell	3,566	75	85	26.37	29.89	+.01	76.6	.0	94	6	88	61	17	65	29	65	59	64	3.63	+1.5	9	7.2	s.	34	s.	10	9	16	6	4.8	.0	.0	7
Southern Plateau							82.8	+1.1										51	1.32	+0.2										3.8			
El Paso [2]	3,778	82	101	26.16	29.84	.00	79.4	+.2	99	13	90	64	15	69	29	65	60	60	3.82	+2.1	13	7.3	e.	27	e.	20	7	18	6	5.5	.0	.0	16
Albuquerque [1]	5,314	5	45	24.78	29.84	.....	75.8	+1.9	94	1	89	58	17	63	33	60	52	52	1.42	+.2	15	9.1	se.	44	se.	10	11	16	4	4.6	.0	.0	22
Phoenix [2]	1,107	39	87	28.65	29.76	−.03	88.8	+.3	108	3	101	66	30	76	33	70	60	45	.68	−.3	4	5.3	e.	27	se.	8	19	6	6	3.3	.0	.0	5
Tucson [1]	2,555	5	23	27.27	29.80	.....	85.2	.....	104	22	98	64	30	72	34	67	58	47	.90	−1.4	9	.....	nw.	.....	.....	.....	15	10	6	4.1	.0	.0	11
Yuma	142	9	54	29.61	29.75	−.01	91.0	+.6	112	2	105	63	30	77	36	73	64	49	1.08	+.6	2	5.6	s.	24	n.	17	26	4	1	1.4	.0	.0	3
Independence	3,957	5	26	25.93	29.87	+.06	78.8	+2.7	102	8	94	53	31	63	39	57	39	...	T	−.1	0	.....	se.	.....	.....	.....	21	9	1	.....	.0	.0	2
Middle Plateau							72.6	+1.5										36	0.71	0.0										2.4			
Reno [1]	4,527	61	76	25.46	29.91	+.07	71.3	+2.6	97	8	88	41	30	54	44	52	40	47	T	−.2	0	6.1	w.	23	w.	26	26	3	2	1.5	.0	.0	1
Tonopah	6,090	9	20	24.08	29.85	.....	74.5	.....	95	8	87	46	28	62	28	53	35	29	.41	.....	2	.....	nw.	.....	.....	.....	19	11	1	.....	.0	.0	2
Winnemucca	4,339	5	56	25.60	29.86	−.02	71.2	+1.9	101	8	92	34	30	51	51	50	32	28	T	−.2	0	7.0	sw.	23	w.	27	22	6	3	2.2	.0	.0	0
Modena	5,473	10	46	.....	29.86	.00	69.2	.0	95	8	86	41	28	52	.....	.....	41	41	2.49	+1.2	6	10.0	sw.	35	w.	28	19	9	3	.....	.0	.0	14
Salt Lake City [1]	4,227	86	47	25.58	29.84	−.07	74.4	+1.6	100	9	90	44	28	59	39	55	40	35	.20	−.7	5	9.8	se.	33	s.	27	22	7	2	2.4	.0	.0	5
Grand Junction	4,602	60	68	25.38	29.89	−.01	76.9	+1.5	99	9	91	57	20	63	33	57	43	36	.84	−.3	4	6.4	se.	26	s.	29	15	13	3	3.7	.0	.0	5
Northern Plateau							72.2	+3.1										43	0.23	−0.2										2.3			
Baker [2]	3,471	36	54	26.43	29.94	−.01	66.7	+2.1	100	19	84	34	29	49	46	52	44	58	.22	−.3	5	6.1	n.	20	w.	23	22	7	2	2.4	.0	.0	4
Boise [1]	2,739	5	49	27.08	29.85	−.08	72.9	+1.9	102	23	89	41	29	57	39	55	41	36	.02	.....	.....	9.3	nw.	38	nw.	4	27	2	2	1.6	.0	.0	2
Pocatello [1]	4,478	5	31	25.46	29.87	−.05	70.3	+1.4	98	10	88	42	14	52	49	51	36	35	.76	+.3	1	8.9	w.	33	se.	11	20	7	4	2.8	.0	.0	3
Spokane [1]	1,929	27	42	27.91	29.90	−.05	70.4	+2.3	101	19	86	40	29	54	43	56	45	47	.08	−.5	4	6.7	n.	26	n.	30	22	7	2	2.7	.0	.0	1
Walla Walla	991	57	65	28.85	29.88	−.08	76.4	+3.7	105	19	90	47	29	62	37	.....	.....	.....	.09	−.4	1	5.6	s.	16	sw.	27	23	6	2	2.0	.0	.0	2
Yakima	1,076	58	67	28.78	29.90	.....	76.6	+7.1	104	19	91	48	26	62	42	59	46	38	.01	−.2	1	7.4	nw.	24	sw.	3	21	10	0	2.5	.0	.0	0
North Pacific Coast Region							65.2	+3.0										71	0.31	−0.5										4.5			
North Head	211	5	56	29.81	30.03	.00	59.9	+2.3	94	14	65	52	29	55	41	57	56	89	.85	−.2	16	11.3	n.	30	n.	19	5	7	19	7.3	.0	.0	1
Seattle [2]	125	90	321	29.56	30.00	.00	67.7	+4.6	96	15	78	52	29	58	35	60	56	70	.53	−.2	2	7.1	n.	24	sw.	3	11	13	7	4.5	.0	.0	1
Tacoma	194	172	201	29.81	30.01	−.01	66.3	+3.7	93	15	75	49	29	57	31	.....	.....	.....	.02	−.7	2	7.3	n.	20	sw.	27	11	9	11	4.9	.0	.0	0
Tatoosh Island	86	9	61	29.94	30.03	+.03	56.4	+1.1	73	14	61	46	30	52	21	55	52	91	.23	−1.8	10	11.5	s.	37	e.	14	5	11	15	6.9	.0	.0	0
Medford [1]	1,329	29	58	28.53	29.91	.....	74.0	.....	105	15	92	46	29	56	47	59	49	49	.09	−.2	1	.....	nw.	.....	.....	.....	25	4	2	1.5	.0	.0	1
Portland, Oreg. [2]	154	68	106	29.82	29.98	−.03	70.2	+3.5	97	14	81	51	26	60	33	61	56	69	.48	−.2	4	5.4	nw.	16	ne.	14	14	10	7	4.0	.0	.0	2
Roseburg	510	45	76	29.43	29.96	−.04	70.8	+2.8	103	14	85	49	30	56	47	60	53	59	T	−.3	0	4.6	n.	20	n.	12	21	8	2	2.3	.0	.0	0
Middle Pacific Coast Region							67.8	+0.8										65	0.02	0.0										3.9			
Eureka	60	72	88	29.93	30.00	.00	57.4	+1.4	66	3	61	49	25	54	12	55	53	89	.06	−.1	5	6.1	n.	17	sw.	18	3	8	20	7.5	.0	.0	0
Redding [1]	722	20	34	29.09	29.85	.....	81.6	+1.1	107	21	96	59	26	68	36	60	43	30	.00	.0	0	7.6	nw.	26	nw.	30	0	1	.7	.0	.0	0
Sacramento [2]	66	92	115	29.78	29.85	.00	73.8	+.9	101	17	90	53	27	57	45	60	51	53	.00	.0	0	7.6	s.	19	s.	24	28	3	0	.8	.0	.0	0
San Francisco	155	112	132	29.75	29.92	.00	58.5	−.6	67	16	63	51	29	54	13	55	54	87	T	.0	0	10.6	w.	27	w.	13	3	15	13	6.7	.0	.0	0
South Pacific Coast Region							73.8	+0.3										63	0.08	+0.1										2.6			
Fresno [1]	327	5	35	29.49	29.82	.00	80.4	+.9	107	18	98	54	28	63	41	62	49	40	T	.0	0	6.3	nw.	17	nw.	31	27	3	1	.9	.0	.0	0
Los Angeles	338	223	250	29.53	29.89	+.01	71.0	−.1	90	17	81	57	27	61	28	62	59	72	.23	+.2	2	5.5	w.	17	w.	30	22	7	2	3.1	.0	.0	1
San Diego [1]	87	20	55	29.80	29.90	+.01	70.0	+.2	81	6	77	58	31	64	20	64	61	76	T	.0	0	6.9	w.	15	w.	22	21	6	4	3.7	.0	.0	1
West Indies																																	
San Juan, P. R.	82	10	54	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Panama Canal																																	
Balboa Heights	118	6	92	.....	[3] 29.85	+.2	80.1	−1.1	91	6	87	71	9	74	18	.....	.....	[3] 88	5.40	−2.3	17	4.6	nw.	19	nw.	5	0	14	17	7.4	.0	.0	13
Cristobal	27	47	97	.....	[3] 29.85	.00	81.4	+1.2	93	25	87	73	9	76	17	76	75	[3] 85	10.74	−4.5	21	6.0	s.	22	n.	6	0	9	22	8.2	.0	.0	16
Alaska																																	
Anchorage	135	36	47	[4] 29.65	[4] 29.86	.....	55.5	−0.1	70	1	63	42	15	48	22	53	48	75	3.59	+1.0	20	5.0	nw.	18	w.	11	2	8	21	8.2	.0	.0	----
Bethel	22	5	32	[4] 29.72	[4] 29.76	.....	53.0	+.3	69	1	59	32	29	47	23	52	49	83	4.72	+.8	22	.....	sw.	.....	.....	.....	0	1	30	9.8	.0	.0	----
Fairbanks	484	11	87	[4] 29.30	[4] 29.81	.....	56.9	+1.7	80	2	66	41	21	48	30	52	47	72	3.49	+1.4	19	6.1	sw.	22	sw.	26	0	8	23	8.3	.0	.0	----
Juneau	132	96	116	[4] 29.95	[4] 30.04	.....	56.9	+1.4	80	1	62	44	21	52	27	54	51	85	7.56	+.2	24	5.7	s.	22	se.	16	4	4	23	8.1	.0	.0	----
Ketchikan	75	69	85	[4] 30.04	[4] 30.06	.....	60.2	+1.7	88	7	67	47	21	53	37	56	53	82	5.18	−6.2	15	6.5	se.	22	nw.	30	4	9	18	7.3	.0	.0	----
Nome	43	25	51	[4] 29.69	[4] 29.71	.....	50.8	+1.2	72	3	57	34	10	45	20	49	47	86	1.61	−1.6	15	10.0	sw.	34	sw.	26	0	8	23	8.5	.0	.0	----
Hawaiian Islands																																	
Honolulu	38	86	100	29.94	29.98	.....	79.2	+.8	85	16	84	73	3	75	11	71	67	70	1.58	+.3	13	9.5	ne.	24	ne.	5	13	8	10	5.1	.0	.0	0

See footnotes at end of table.

LATE REPORTS FOR JULY 1942

District and station	Elevation of instruments: Barometer above sea level	Elevation of instruments: Thermometer above ground	Elevation of instruments: Anemometer above ground	Pressure: Station, reduced to mean of 24 hours	Pressure: Sea level, reduced to mean of 24 hours	Pressure: Departure from normal	Temperature of the air: Mean max. + min. ÷2	Temperature of the air: Departure from normal	Temperature of the air: Maximum	Temperature of the air: Date	Temperature of the air: Mean maximum	Temperature of the air: Minimum	Temperature of the air: Date	Temperature of the air: Mean minimum	Temperature of the air: Greatest daily range	Mean wet thermometer	Mean temperature of the dew-point	Mean relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Days with 0.01 inch or more	Wind: Average hourly velocity	Wind: Prevailing direction	Wind: Maximum velocity: Miles per hour	Wind: Maximum velocity: Direction	Wind: Maximum velocity: Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month	Number of days with thunderstorms
Alaska	*Ft.*	*Ft.*	*Ft.*	*In.*	*In.*	*In.*	*° F.*	*° F.*	*°F.*		*°F.*	*°F.*		*°F.*	*°F.*	*°F.*	*° F.*	*%*	*In.*	*In.*		*Miles*								*0–10*	*In.*	*In.*	
Anchorage	135	36	47	[4]29.81	[4]30.01	.....	57.8	+0.8	73	31	64	47	14	51	21	53	49	72	1.83	+0.2	12	5.0	w.	18	s.	1	2	10	19	7.7	0.0	0.0	.....
Barrow	25	4	27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bethel	22	8	32	[4]29.90	[4]29.94	.....	53.7	−.6	75	22	61	37	5	46	37	55	48	81	1.95	−.4	15	.....	sw.	.....	.....	.....	2	2	27	8.9	.0	.0	.....
Fairbanks	484	11	87	[4]29.43	[4]29.92	.....	60.8	+.8	82	24	72	41	8	50	34	54	48	70	1.65	−.2	16	5.8	w.	26	s.	7	1	11	19	7.6	.0	.0	.....
Juneau	132	96	116	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ketchikan	75	69	85	[4]30.03	[4]30.05	.....	61.8	+4.0	81	29	70	45	10	54	29	56	52	74	2.68	−5.2	10	6.8	se.	23	se.	4	7	6	18	6.8	.0	.0	.....
Nome	43	25	51	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
McGrath	331	4	31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

[1] Data are airport records.
[2] Barometric data (adjuted to old city elevation) and hygrometric data from airport; otherwise city office records.
[3] Observations taken bihourly.
[4] Pressure not reduced to a mean of 24 hours.
[5] Barometric data from airport; other data from city office records.
[6] Wind, clear, partly cloudy, and cloudy data from city office records; other data from airport.

NOTE.—Except as indicated by notes 1, 2, 5 and 6 data in table are city office records.

SEVERE LOCAL STORMS, AUGUST 1942

(Compiled by Mary O. Souder)

[The table herewith contains such data as has been received concerning severe local storms that occurred during the month. A revised list of tornadoes will appear in the United States Meteorological Yearbook]

Place	Date	Time	Width of path, yards	Loss of life	Value of property destroyed	Character of storm	Remarks
Grand Meadows, Minn., and vicinity.	1	3 a. m.	[1]3	.....	$5,000	Thunderstorm and hail.	Much loss in growing crops; path 6 miles long.
Lanesboro, Minn., vicinity of.	1	A. m.	.....	.....	1,600	Electrical	10 cows and 2 steers killed by lightning on a farm where they were huddled together under a tree on a knoll.
Milwaukee, Wis., and vicinity.	1	9 p. m., C. T.	.....	.....	.....	Electrical and heavy rain.	Number of trees blown down or branches broken off; damage to electric wires and service cut off in some sections of the city for some time. Streets flooded, motorists stalled, and streetcars off schedule.
Platteville, Wis.	1	.....	.....	.....	.....	Thundersquall	Wires torn out by falling branches and transformer fuses blown out causing suspension of electric service; some roofs damaged.
Hughes County, S. Dak.	4	9 p. m.	[1]1	1	20,000	High wind, heavy rain and hail.	Building demolished fatally injuring 1 person; pheasants and other birds killed on several farms. Some crops total loss; amount not estimated.
Chester County, S. C.	4	P. m.	.....	.....	700	Electrical	Property damaged.
Valley Falls, Kans., and vicinity.	6	12:45 a. m.	[1]1	.....	500	Violent wind and hail.	Chief damage from wind; several buildings unroofed; path 2 miles long.
Burwell, Nebr., vicinity of.	6	7 p. m.	[1]4	.....	10,000	Hail	No details.
Gosper County, Nebr.	6	do.	[1]8	.....	40,000	do.	Loss in corn and feed crops about $30,000; to buildings, livestock, etc., $10,000.
Sargent, Nebr., and vicinity.	6	do.	[1]3	.....	60,000	do.	Loss in corn; damage to buildings; path 25 miles long.
Beaver City, Nebr., and vicinity.	6	8:30–9 p. m.	[1]8	.....	20,000	do.	Loss in corn and feed crops; damage to windows, roofs, and gardens.
Scottsbluff County, Nebr., north-eastern portion.	6	9 p. m.	[1]1	.....	5,000	do.	No details.
North Platte, Nebr., and vicinity.	6	P. m.	[1]2–4	.....	25,000	Hail and wind	Extensive damage to trees, buildings, and glass in North Platte, and and to crops and farm buildings between North Platte and Brady.
Tenas Gorge Canyon, in vicinity of Wenatchee, Wash.	6	do.	.....	8	2,650	Flash flood	Auto buried in slide which resulted from culverts plugging during short period of intense local rainfall. Damage to car and highway and railroad fills and guard rails.
Mystic, Melrose, and Iconium, Iowa and vicinities.	6–7	.....	.....	.....	.....	Rain and flood	Heavy rain caused the overflow of bottom lands from Cedar Creek. A railroad roadbed was damaged; many rural roads under water; at least 40 sheep drowned and hundreds of acres of soybeans flooded when Cedar Creek left its banks from headwaters, to near the Marion line. Some hail damage in eastern Monroe County.
Chouteau County, Mont.	7	5 p. m.	[1]6	.....	100,000	Heavy hail	Loss in wheat; path 12 miles long.
Cedar County, Nebr., northwestern portion.	7	8 p. m.	[1]2–4	.....	10,000	Hail	No details.
Bucks, Chester, Lancaster, and Montgomery Counties, Pa.	8–9	.....	.....	2	1,000,000	Heavy rain	Streams rose forcing persons to leave their homes. Industrial plants were flooded and machinery wrecked; 2 persons drowned. Roads flooded; all traffic detoured, and 17 bridges damaged or lost.
Mecca, Calif.	9	A. m.	.....	.....	.....	Rain	Heavy rains over northern foothills caused flood over Mecca; no serious damage.
Death Valley, Calif.	9	3:15 p. m.	.....	.....	.....	do.	Torrential rains over Furnace Creek, Wash. 5 miles of telephone lines and 8 miles of highway torn out.
Scottsbluff County, Nebr., northeastern portion.	9	8 p. m.	[1]2	.....	70,000	Hail	No details.
Osborn and Russell Counties, Kans.	9	9:30 p. m.	[1]15	0	15,400	Tornado, violent wind and hail.	Violent straight-line winds occurred over a strip extending from near the middle of Osborn County to near the middle of Russell County. A tornado was sighted during lightning flashes near Waldo. Details of its path not known, chief damage being from straight wind.
Holdrege, Nebr., and vicinity.	9	P. m.	[1]3	.....	5,000	Hail	No details.
Banner County, Nebr., northwestern portion.	10	4–6 p. m.	[1]3	.....	5,000	do.	Do.
Gaffney, S. C., and vicinity.	10	P. m.	.....	.....	11,000	Thunderstorm and hail.	Roofs and chimneys damaged; some outbuildings damaged or blown down, damage, $10,000; loss in cotton from hail, $1,000.

[1] Miles instead of yards.

485806—42——2

SEVERE LOCAL STORMS, AUGUST 1942—Continued

Place	Date	Time	Width of path, yards	Loss of life	Value of property destroyed	Character of storm	Remarks
Ancho, N. Mex.	12	4 p. m.	[1] 2		1,000	Hail	Property damaged.
Valley and Daniels Counties, Mont.	12	8–10 p. m.	[1] 3		25,000	Heavy hail	Loss in crops; path 26 miles long.
Norton and Graham Counties, Kans.	13	2 a. m.				do	Some hailstones as large as hen eggs. Corn, feed crops and gardens badly damaged over southern portion of the path.
Schuyler and Tompkins Counties, N. Y.	13					Rain	Heavy rains caused streams to rise with resultant floods in southern Schuyler and Tompkins Counties. Roads were blocked and crops washed out; traffic disrupted, dams broken, and some homes in Watkins Glen and Montour Falls flooded.
Harrisburg, Pa., and vicinity	16				28,000	Electrical and rain	Barns burned; streets and cellars flooded.
Osceola County, Iowa	17	11 p. m.	[1] 2–3	3	80,000	Hail	Loss in flax, corn, oats, and other crops; about 30 farms affected; path 6 miles long.
Jefferson County, Tex.	21				380,000	Wind, heavy rain, decidedly high tides.	High tides were responsible for considerable damage to water-front installations, the total loss estimated at $15,000. No estimate of damage to highway between Sabine Pass and Bolivar is available. Winds damaged property in Jefferson County to the extent of $65,000, and loss in rice crop approximately 15 percent or $300,000. There was no loss of life or serious injury.
Alden, Kans., 4 miles east	22	1 p. m.		0		6 small tornadoes	6 vortex clouds plainly seen descending from the parent storm cloud about 4 miles east of Alden. These were seen to rotate and extend downward, but none reached the ground.
Lake County, Ind.	22	3:50 p. m.		3		Wind	125-foot smoke stack at Gary, Ind., blown over; 3 persons injured; many trees blown over.
Blanchard, La., vicinity of	22				10,000	do	Storm occurred just before daylight; 2 homes demolished, others damaged; timber blown down; cotton and other crops destroyed. Damage to buildings, $3,000; loss in crops, mostly cotton; $7,000.
Chautauqua County, N. Y.	24			1		Thunderstorm and heavy rain.	This storm in the Westfield-Fredonia area flooded highways and washed out roads and bridges. Due to undermining a Pennsylvania Railroad train was derailed near Mayville, killing a fireman and injuring 3 passengers.
Imperial, Calif.	24	6:15 p. m.	880		2,000	Straight-line wind	Power and telephone poles snapped off; trees uprooted; old building blown down.
Springfield, S. Dak.	24	P. m.				Heavy rain and hail	Considerable damage to gardens, trees and other vegetation. Hail several inches deep on ground; path narrow.
Phoenix, Ariz., eastern portion.	25	3:30 a. m., m. w.	t.			Thunderstorm	The apparent center of activity was located in the northeastern section of the Phoenix Municipal Airport. It so happened that a large number of airplanes were staked out in the open field in the apparent center of storm activity and some 15 of the ships were badly damaged, in some cases the planes were practically demolished, while some sustained repairable damage. Unusually sharp lightning accompanied this storm which was not only unusual because of its localized nature, but because it seems to have been the only development which took place over a rather extensive area and was of a type which would have been extremely difficult to forecast. Damage not estimated.
Tabor and Sidney, Iowa, and vicinities.	27	3:45 p. m.		4	12,000	Wind and hail	Buildings damaged and crops flattened; telephone and power lines down.
Blaine, Phillips, and Valley Counties, Mont.	27	4:30 p. m.			25,000	Heavy hail	Loss in wheat, oats, barley and flax; path 30 miles long.
McCone, Valley, and Roosevelt Counties, Mont.	27		[1] 7		10,000	Hail	Loss in crops; path 40 miles long.
Sebeka, Minn., and vicinity	28–29	P. m. and a. m.			5,000	Rain and flood	Heavy to excessive rains in connection with a severe thunderstorm resulted in a flash flood in Cat Creek near Sebeka, Minn. Basements of buildings flooded and roads and bridges damaged.
Draper and Vivian, S. Dak.	29	P. m.				High wind	3 large barns blown down, granaries and other buildings damaged; some stock killed; path narrow.
International Falls, Minn., and vicinity.	30	A. m. and p. m.			61,200	Rain and flood	Heavy to excessive rains in connection with a severe thunderstorm, resulted in a flash flood in a creek at International Falls. Number of families were forced to leave their homes. An entire business block was damaged. Much loss in matured crops.
Sibley, Iowa	31	4:15 p. m.			2,000	Wind	Trees uprooted: garage and several buildings damaged; barn blown over; wire service disrupted.

[1] Miles instead of yards.

SOLAR RADIATION AND SUNSPOT DATA FOR AUGUST 1942

[Solar Radiation Investigations Section, I. F. HAND in charge]

SOLAR RADIATION OBSERVATIONS

Explanations of the tables and references to descriptions of instruments, stations and methods of observation, and to summaries of data, are given in the January 1942 REVIEW, p. 20.

Early in September 1942, Dr. Hans Neuberger, in charge of the meteorological department at the State College, Pennsylvania, installed a new Eppley pyrheliometer as replacement for the modified pyrheliometer formerly in use at that station. With the addition of this new instrument, all data that appear in table 2 are obtained through the use of the new-type Eppley pyrheliometer.

TABLE 1.—*Solar radiation intensities during August 1942*

[Gram-calories per minute per square centimeter of normal surface]

Lincoln, Nebr.

Date	Sun's zenith distance: 7:30 a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	1:30 p.m.
	75th mer. time	Air Mass: A. M.					P. M.				Local mean solar time
	e.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
Aug. 4	13.26	------	------	------	------	1.34	1.08	0.90	0.77	0.69	12.78
Aug. 10	14.22	------	------	------	------	1.23	------	------	------	------	15.80
Aug. 11	12.34	------	------	------	------	1.06	------	------	------	------	13.72
Aug. 17	11.89	------	------	------	------	0.85	0.47	.31	.22	.16	13.72
Aug. 18	12.34	------	------	------	------	.92	.52	.24	.12	.08	13.26
Aug. 19	14.73	------	------	------	0.43	1.13	------	------	------	------	16.36
Aug. 20	16.36	------	------	------	.92	1.22	------	------	------	------	15.27
Aug. 21	15.80	------	------	------	.86	1.13	------	------	------	------	------
Aug. 24	8.86	------	------	------	------	1.14	------	------	------	------	12.34
Aug. 27	18.77	------	------	0.79	.94	------	------	------	------	------	21.49
Aug. 29	18.77	------	------	------	------	1.24	------	------	------	------	19.43
Obs.	------	------	------	1	4	10	3	3	3	3	------
Means	------	------	------	(.79)	.79	1.13	(.69)	(.48)	(.37)	(.31)	------
Departures	------	------	------	−.12	−.30	−.18	−.38	−.40	−.38	−.33	------

*Extrapolated.

Madison, Wis.

Aug. 4	10.21	0.74	0.86	0.98	1.14	1.42	------	------	------	------	10.21
Aug. 10	13.13	------	------	.36	.60	.84	------	------	------	------	13.13
Aug. 11	8.48	.75	.88	1.02	1.11	1.26	------	------	------	------	7.57
Aug. 12	8.18	------	------	.34	.57	.81	------	------	------	------	9.47
Aug. 15	12.68	------	------	.47	.66	------	------	------	------	------	11.38
Aug. 19	12.68	------	------	------	.47	.78	------	------	------	------	14.10
Aug. 20	14.10	------	------	.47	.64	------	------	------	------	------	18.59
Aug. 21	18.59	------	.57	.69	.91	1.22	------	------	------	------	13.13
Aug. 24	6.27	------	.59	.87	1.18	1.42	------	------	------	------	6.02
Obs.	------	2	4	8	9	7	------	------	------	------	------
Means	------	(.70)	.79	(.92)	1.08	1.32	------	------	------	------	------
Departures	------	+.04	−.07	−.27	−.27	−.21	------	------	------	------	------

TABLE 1.—*Solar radiation intensities during August 1942*—Con.

Blue Hill, Mass.

Date	Sun's zenith distance: 7:30 a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	1:30 p. m.
	75th mer. time	Air Mass: A. M.					P. M.				Local mean solar time
	e.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
Aug. 3	16.3	------	------	1.04	1.17	------	------	------	0.73	0.62	15.2
Aug. 4	14.1	------	------	------	------	------	1.00	------	.63	.53	14.6
Aug. 5	10.9	0.80	0.89	------	------	------	------	------	------	------	11.3
Aug. 6	11.3	.70	------	0.92	1.06	------	------	------	------	------	13.1
Aug. 7	12.6	------	.76	.91	1.10	------	------	0.74	.61	.50	12.6
Aug. 8	14.1	------	------	------	1.11	------	------	------	------	------	16.3
Aug. 19 [1]	15.7	------	------	------	0.64	------	------	.19	.12	.07	17.5
Aug. 20 [1]	16.3	------	------	.10	.22	------	.40	.21	.13	------	18.2
Aug. 25	9.4	.73	.83	.94	------	------	------	.76	.63	.54	8.0
Aug. 26	9.0	.85	.92	1.03	------	------	1.09	.89	.72	.59	9.4
Aug. 27	10.1	.80	.93	1.02	------	1.27	------	.76	.57	.43	11.7
Aug. 30	13.1	------	------	------	------	1.37	1.23	1.05	.89	.77	10.5
Aug. 31	9.7	.71	1.06	1.15	1.26	1.27	1.07	------	.65	.42	12.2
Obs.	------	6	6	8	7	3	5	7	10	9	------
Means	------	.69	.84	.90	1.05	(1.28)	1.04	.85	.66	.53	------
Departures	------	−.08	−.06	+.01	+.12	−.02	+.08	+.19	+.09	+.03	------

[1] A sharp inversion with much smoke and haze overhead prevailed on the 19th and 20th.

Albuquerque, N. Mex.

Aug. 1	11.81	------	0.91	1.01	1.18	1.40	------	------	------	------	10.97
Aug. 2	9.47	0.81	.92	1.03	1.19	1.40	------	------	------	------	10.59
Aug. 4	12.24	.85	.91	1.02	------	------	------	------	------	------	11.38
Aug. 5	9.83	------	------	------	------	1.38	------	------	------	------	11.38
Aug. 6	10.59	.82	.93	1.04	1.19	1.38	------	------	------	------	10.21
Aug. 8	12.24	------	------	------	------	1.39	------	------	------	------	11.81
Aug. 11	10.59	------	------	------	------	1.38	1.17	------	------	------	10.59
Aug. 12	12.24	.89	.99	1.09	1.22	1.38	------	------	------	------	11.81
Aug. 13	13.61	------	------	------	------	1.40	------	------	------	------	10.97
Aug. 15	9.47	.79	.91	1.04	1.20	------	------	------	------	------	9.83
Aug. 16	9.83	------	------	------	------	------	1.07	0.86	0.74	------	7.87
Aug. 17	8.18	.68	.78	.90	1.08	1.39	1.44	.95	.82	0.75	8.48
Aug. 18	8.18	.64	.75	.88	1.08	1.41	1.11	.92	.76	.65	9.47
Aug. 19	8.81	.63	.75	.88	1.06	1.34	------	------	------	------	9.14
Aug. 20	7.57	------	------	------	------	------	------	.93	.77	.65	9.47
Aug. 21	10.59	.66	.78	.93	1.12	1.33	1.10	------	------	------	10.21
Aug. 22	8.48	.67	.76	.89	1.08	1.36	------	------	------	------	6.76
Aug. 24	12.68	------	------	------	------	------	1.12	.95	------	------	12.24
Aug. 25	11.38	------	------	.90	1.07	1.36	1.07	.91	.76	------	10.59
Aug. 27	10.21	.66	.76	.90	------	1.35	------	------	------	------	11.38
Aug. 28	10.21	------	------	------	1.07	1.29	------	------	------	------	7.57
Aug. 30	11.81	------	.78	.90	1.10	1.39	------	------	------	------	12.24
Obs.	------	11	13	14	13	17	7	6	5	3	------
Means	------	.51	.53	.58	.76	.69	.79	.64	.67	.68	------
Departures	------	+.23	+.31	+.38	+.37	+.68	+.32	+.28	+.10	------	------

TABLE 2.—*Daily totals and weekly means of solar radiation (direct + diffuse) received on a horizontal surface*

[Gram-calories per square centimeter]

Date	Washington	Madison	Lincoln*	Chicago	New York	Fresno	Fairbanks	Cambridge	Nashville	Twin Falls	New Orleans	Riverside	Blue Hill	Friday Harbor	Ithaca	Newport	State College	Put-in-Bay	San Juan u. v. below 3132 Å	East Wareham
1942	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*milli-cal.*	*cal.*
July 30	568	231	.....	220	474	692	.....	97	456	696	248	623	147	521	522	196	605	550	392	185
July 31	360	617	.....	655	158	704	.....	371	337	689	601	598	385	648	277	469	364	538	44	487
Aug. 1	562	172	.....	128	644	708	.....	563	517	523	536	619	556	543	627	608	521	384	334	549
Aug. 2	436	509	.....	188	383	711	.....	505	434	615	585	598	482	570	271	504	318	206	360	526
Aug. 3	452	584	.....	492	601	692	.....	644	402	628	268	557	655	637	730	711	611	555	444	666
Aug. 4	312	689	.....	666	397	656	.....	546	120	633	620	547	513	586	587	366	492	646	328	428
Aug. 5	112	591	.....	670	449	663	.....	645	306	614	610	580	652	643	681	562	460	652	382	607
Mean	**400**	**485**	.....	**431**	**444**	**689**	**444**	**482**	**367**	**628**	**496**	**589**	**484**	**592**	**528**	**488**	**482**	**504**	**334**	**493**
Departure	**−84**	**+6**	.....	**−27**	**−29**	**+29**	**+88**	**+6**	.....	**+63**	**+84**	**+34**	**−34**	**+26**	**+12**	**−48**	**−55**	.....	.....	.....
Aug. 6	514	230	.....	142	629	656	.....	475	454	590	576	579	576	516	673	488	683	445	334	550
Aug. 7	308	356	.....	159	529	657	.....	585	311	639	687	564	570	638	681	607	497	286	241	612
Aug. 8	81	272	.....	353	203	648	.....	416	224	626	605	534	450	487	163	556	28	335	442	591
Aug. 9	249	462	.....	412	43	535	.....	76	400	454	570	233	79	579	269	61	213	380	165	103
Aug. 10	509	520	.....	388	352	274	.....	194	347	597	565	604	194	420	352	272	411	485	381	256
Aug. 11	554	625	.....	676	273	623	.....	562	108	358	393	602	558	411	463	538	475	563	159	440
Aug. 12	262	565	.....	618	124	559	.....	333	405	638	186	600	332	606	511	301	226	547	402	328
Mean	**354**	**433**	.....	**392**	**308**	**564**	**474**	**377**	**321**	**557**	**512**	**531**	**394**	**522**	**445**	**403**	**362**	**434**	**316**	**411**
Departure	**−94**	**−29**	.....	**−34**	**−115**	**−59**	**+142**	**−122**	.....	**+7**	**+95**	**+16**	**−108**	**−29**	**−28**	**−95**	**−128**	.....	.....	.....
Aug. 13	383	499	.....	495	108	629	.....	95	490	658	574	621	118	640	170	89	178	477	63	101
Aug. 14	524	216	.....	588	234	631	.....	167	343	638	432	576	193	635	512	180	485	487	181	138
Aug. 15	486	519	.....	428	341	633	.....	398	467	627	338	593	312	605	518	314	541	410	310	254
Aug. 16	406	617	.....	381	320	622	.....	439	379	613	497	568	351	536	490	475	481	371	.....	370
Aug. 17	169	450	.....	443	307	620	.....	407	259	590	246	499	317	568	307	425	166	529	252	383
Aug. 18	337	423	.....	489	412	624	.....	501	94	579	481	539	489	616	565	469	512	483	404	463
Aug. 19	473	531	.....	459	479	625	.....	438	355	590	199	568	471	569	472	528	544	478	231	504
Mean	**397**	**465**	.....	**469**	**314**	**626**	**332**	**349**	**341**	**614**	**395**	**566**	**322**	**596**	**433**	**354**	**415**	**462**	**315**	**316**
Departure	**−41**	**+19**	.....	**+50**	**−69**	**+12**	**−13**	**−72**	.....	**+96**	**+30**	**+46**	**−133**	**+46**	**−40**	**−101**	**−51**	.....	.....	.....
Aug. 20	461	320	.....	537	431	624	.....	469	309	367	94	581	483	522	537	472	474	556	466	444
Aug. 21	291	561	.....	542	381	609	.....	444	187	605	202	584	455	588	461	460	347	371	306	449
Aug. 22	536	365	.....	372	435	578	.....	307	286	592	528	543	314	.....	302	372	385	434	.....	358
Aug. 23	307	452	.....	552	309	566	.....	456	238	577	484	562	460	590	177	472	90	447	.....	479
Aug. 24	556	612	.....	439	529	589	.....	470	521	317	279	580	405	519	553	522	422	424	178	362
Aug. 25	627	510	.....	569	647	615	.....	579	454	363	373	556	592	471	635	623	651	591	194	606
Aug. 26	563	291	.....	390	580	615	.....	570	305	596	255	600	584	263	566	595	623	500	110	612
Mean	**477**	**444**	.....	**486**	**473**	**600**	**286**	**471**	**332**	**488**	**316**	**572**	**470**	**492**	**462**	**502**	**428**	**475**	**252**	**473**
Departure	**+55**	**+2**	.....	**+57**	**+98**	**+10**	**−30**	**+21**	.....	**−34**	**−73**	**+71**	**−22**	**+22**	**−18**	**+42**	**−61**	.....	.....	.....
Aug. 27	563	134	.....	222	324	626	.....	482	414	464	614	593	566	416	580	617	580	164	105	584
Aug. 28	469	376	.....	302	426	515	.....	285	453	410	352	594	307	510	127	461	239	214	459	449
Aug. 29	287	319	546	409	63	586	.....	283	482	481	230	607	210	555	246	261	472	491	.....	350
Aug. 30	360	507	374	420	359	579	.....	588	444	576	447	448	580	562	483	620	392	528	349	612
Aug. 31	506	492	423	303	574	562	.....	509	409	580	431	262	554	558	588	629	530	521	339	602
Sept. 1	433	378	430	430	388	553	.....	451	366	570	428	305	520	549	590	565	574	513	.....	534
Sept. 2	416	192	50	176	513	556	.....	491	181	566	492	459	506	551	523	534	466	546	341	513
Mean	**433**	**343**	**365**	**323**	**378**	**568**	**194**	**441**	**393**	**521**	**428**	**467**	**463**	**529**	**448**	**527**	**465**	**425**	**321**	**521**
Departure	**+11**	**−65**	.....	**−36**	**+69**	**−106**	**−78**	**+39**	.....	**+34**	**+18**	**−8**	**+47**	**+115**	**−60**	**+89**	**−13**	.....	.....	.....
ACCUMULATED DEPARTURES ON SEPTEMBER 2, 1942																				
	+1773	**−3731**	.....	**+4263**	**−2107**	**+1204**	**+3668**	**−3577**	.....	**+2009**	**+8372**	**+8398**	**−8981**	**−725**	**−798**	**−3304**	**−4754**	.....	.....	.....

* Broken pyrheliometer; replaced Aug. 20.

POSITIONS, AREAS, AND COUNTS OF SUNSPOTS FOR AUGUST 1942

[Communicated by Capt. J. F. Hellweg, U. S. N. (Ret.), Superintendent, U. S. Naval Observatory.] All measurements and spot counts were made at the Naval Observatory from plates taken at the observatories indicated. Difference in longitude is measured from the central meridian, positive toward the west. Latitude is positive toward the north. Areas are corrected for foreshortening and expressed in millionths of Sun's hemisphere. For each day, under longitude, latitude, area of spot or group, and spot count, are included assumed longitude of center of the disk, assumed latitude of center of the disk, total area of spots and groups, and total spot count.

Date	Eastern standard time	Mount Wilson group No.	Heliographic: Difference longitude	Heliographic: Longitude	Heliographic: Latitude	Heliographic: Distance from center of disk	Area of spot or group	Spot count	Plate quality	Observatory
1942	*h m*		°	°	°	°				
Aug. 1	10 45	7470	−38	286	+16	40	12	1	G	U. S. Naval.
		7469	−25	299	−2	26	194	1		
		7469	−24	300	−3	27	24	5		
				(324)	(+6)		230	7		
Aug. 2	8 32	7469	−12	300	−2	14	218	3	VG	Mt. Wilson.
		7469	−11	301	−3	16	24	4		
				(312)	(+6)		242	7		

See footnotes at end of table.

POSITIONS, AREAS, AND COUNTS OF SUNSPOTS FOR AUGUST 1942—Continued

Date	Eastern standard time	Mount Wilson group No.	Heliographic: Difference longitude	Heliographic: Longitude	Heliographic: Latitude	Heliographic: Distance from center of disk	Area of spot or group	Spot count	Plate quality	Observatory
1942	*h m*		°	°	°	°				
Aug. 3	11 41	7471	−68	229	+12	68	48	5	F	U. S. Naval.
		7469	+2	299	−2	8	218	2		
		7469	+2	299	−3	9	24	4		
				(297)	(+6)		290	11		
Aug. 4	8 38	7471	−55	230	+12	55	73	12	G	Mt. Wilson.
		7469	+15	300	−3	17	242	5		
				(285)	(+6)		315	17		
Aug. 5	8 54	7471	−37	235	+11	37	24	6	G	Do.
		7469	+29	301	−3	31	194	5		
				(272)	(+6)		218	11		
Aug. 6	10 43	7471	−23	234	+10	24	24	2	F	U. S. Naval.
		7469	+43	300	−3	44	194	5		
				(257)	(+6)		218	7		

See footnotes at end of table.

POSITIONS, AREAS, AND COUNTS OF SUNSPOTS FOR AUGUST 1942—Continued

Date	Eastern standard time	Mount Wilson group No.	Heliographic: Difference longitude	Heliographic: Longitude	Heliographic: Latitude	Heliographic: Distance from center of disk	Area of spot or group	Spot count	Plate quality	Observatory
1942	h m		°	°	°	°				
Aug. 7	11 26	7471	−10	234	+10	11	48	6	G	Do.
		7469	+57	301	−3	58	194	1		
				(244)	(+6)		242	7		
Aug. 8	8 46	7472	−45	187	−14	47	48	4	P	Mt. Wilson.
		7471	−1	231	+11	6	73	1		
		7471	+3	235	+10	5	48	7		
		7469	+71	303	−3	72	145	1		
				(232)	(+6)		314	13		
Aug. 9	8 26	7471	+13	232	+11	14	73	1	F	Do.
		7471	+15	234	+10	16	24	3		
		7469	+85	304	−4	85	97	1		
				(219)	(+6)		194	5		
Aug. 10	11 16	7471	+28	232	+10	28	97	9	F	U. S. Naval.
				(204)	(+6)					
							97	9		
Aug. 11	10 49	7471	+40	231	+10	40	48	5	F	Do.
				(191)	(+6)		48	5		
Aug. 12	11 54	7473	−85	92	+11	85	97	1	P	Do.
				(177)	(+6)		97	1		
Aug. 13	11 39	7473	−71	93	+11	71	97	1	G	Do.
				(164)	(+7)		97	1		
Aug. 14	10 50	7473	−57	95	+11	57	73	1	F	Do.
				(152)	(+7)		73	1		
Aug. 15	10 30	7473	−44	95	+12	44	48	2	G	Do.
		7474	−29	110	+16	31	24	2		
		(*)	−9	130	−1	12	6	2		
		(*)	−3	136	+5	3	6	3		
		(*)	+30	169	+9	30	12	3		
				(139)	(+7)		96	12		
Aug. 16	11 37	(*)	−30	95	+15	32	6	2	G	Do.
		7473	−30	95	+11	30	48	2		
		7474	−16	109	+16	18	48	8		
				(125)	(+7)		102	12		
Aug. 17	8 44	7473	−17	96	+12	18	24	5	VG	Mt. Wilson.
				(113)	(+7)		24	5		
Aug. 18	12 18	7473	−3	95	+12	7	24	2	F	U. S. Naval.
				(98)	(+7)		24	2		
Aug. 19	11 5	7475	−86	359	+9	86	145	1	F	Do.
		7473	+9	94	+12	10	6	1		
				(85)	(+7)		151	2		
Aug. 20	11 48	7475	−73	359	+9	73	145	1	F	Do.
		7476	+33	105	+1	34	24	2		
				(72)	(+7)		169	3		
21	8 52	7475	−67	353	+9	67	194	1	VG	Mt. Wilson.
		7475	−58	2	+9	58	24	2		
		7476	+49	109	+1	49	36	4		
		7477	+57	117	+11	57	12	3		
				(60)	(+7)		266	10		
22	10 8	7475	−44	2	+9	44	194	1	F	U. S. Naval.
		7478	−3	43	−7	14	12	3		
		7476	+63	109	+1	63	12	1		
		7477	+70	116	+11	70	24	4		
				(46)	(+7)		242	9		
23	10 52	7475	−30	3	+9	30	194	4	G	Mt. Wilson.
		7478	+10	43	−7	17	194	21		
		7476	+77	110	+1	77	24	7		
		7477	+84	117	+11	84	24	1		
				(33)	(+7)		436	33		

POSITIONS, AREAS, AND COUNTS OF SUNSPOTS FOR AUGUST 1942—Continued

Date	Eastern standard time	Mount Wilson group No.	Heliographic: Difference longitude	Heliographic: Longitude	Heliographic: Latitude	Heliographic: Distance from center of disk	Area of spot or group	Spot count	Plate quality	Observatory
1942	h m		°	°	°	°				
24	11 4	7475	−23	356	+9	23	97	12	VG	U. S. Naval.
		7475	−18	1	+9	18	194	3		
		7478	+23	42	−8	27	388	16		
				(19)	(+7)		679	31		
25	11 18	(*)	−61	305	−5	62	12	3	VG	Do.
		7475	−11	355	+9	12	97	12		
		7475	−4	2	+9	5	218	7		
		7478	+38	44	−8	41	291	19		
				(6)	(+7)		618	41		
26	10 31	7479	−80	273	+6	80	194	1	G	Do.
		7475	+3	356	+9	3	97	10		
		7475	+9	2	+9	10	194	6		
		7478	+50	43	−8	52	291	23		
				(353)	(+7)		686	40		
27	11 18	7480	−80	260	−2	80	12	1	VG	Do.
		7479	−70	270	+7	70	145	6		
		7479	−64	276	+6	64	194	1		
		7475	+14	354	+9	15	12	4		
		7475	+23	3	+9	23	194	1		
		7478	+64	44	−8	66	339	15		
				(340)	(+7)		896	28		
28	12 9	7479	−56	270	+6	56	145	4	P	Do.
		7479	−50	276	+6	50	194	1		
		7475	+36	2	+9	36	194	1		
		7478	+77	43	−8	77	291	3		
				(326)	(+7)		824	9		
29	10 20	7479	−44	270	+5	44	48	4		Do.
		7479	−38	276	+5	38	97	3		
		7475	+50	4	+9	50	194	1		
				(314)	(+7)		339	8		
30	9 17	7479	−32	269	+5	32	48	4	F	Mt. Wilson.
		7479	−24	277	+5	24	97	8		
		7475	+66	7	+9	66	145	1		
				(301)	(+7)		290	13		
31	11 42	7479	−9	278	+6	10	48	2	F	U. S. Naval.
		7475	+80	7	+9	80	145	1		
				(287)	(+7)		193	3		

Mean daily area for 31 days = 281

(*) Not numbered.
VG = very good; G = good; F = fair; P = poor.

PROVISIONAL RELATIVE SUNSPOT NUMBERS FOR AUGUST 1942

[Based on observations at Zurich. Data furnished through the courtesy of Prof. W. Brunner, Eidgen. Sternwarte, Zurich, Switzerland]

August 1942	Relative numbers	August 1942	Relative numbers	August 1942	Relative numbers
1	21	11	8	21	28
2	11	12	0	22	27
3	*Eac* 22	13	7	23	*Mac* 47
4	23	14	7	24	34
5	*20	15	7	25	36
6	20	16	17	26	*ad* 47
7	19	17	8	27	43
8	*a* 28	18	7	28	34
9	18	19	0	29	26
10	12	20	*d* 10	30	19
				31	17

Mean, 31 days = 20.1

*Observed at Locarno.
a = Passage of an average-sized group through the central meridian.
b = Passage of a large group through the central meridian.
c = New formation of a group developing into a middle-sized or large center of activity; E, on the eastern part of the sun's disk; W, on the western part; M, in the central circle zone.
d = Entrance of a large or average-sized center of activity on the east limb.

Chart I. Departure (°F.) of the Mean Temperature from the Normal, and Wind Roses for Selected Stations, August 1942

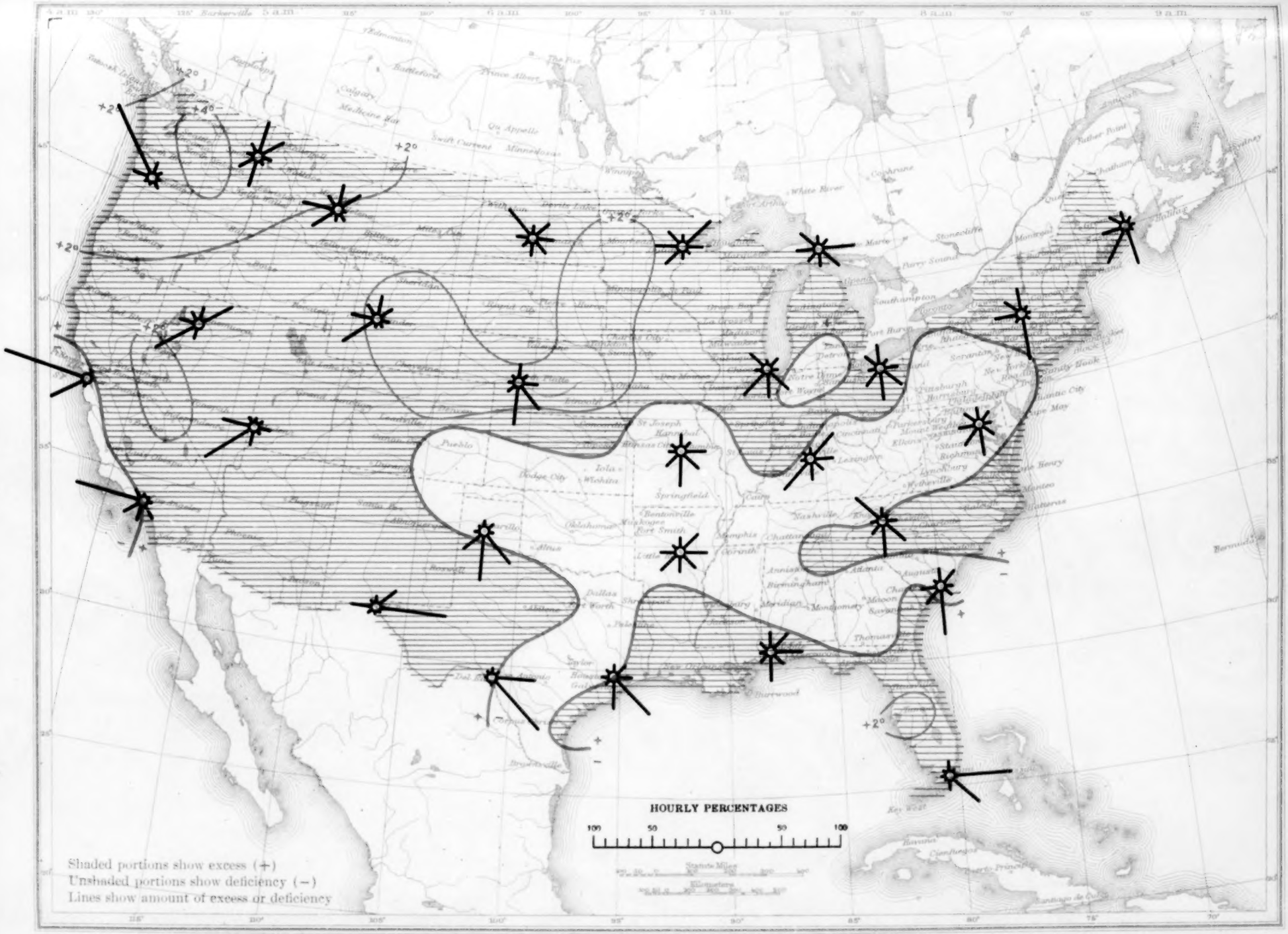
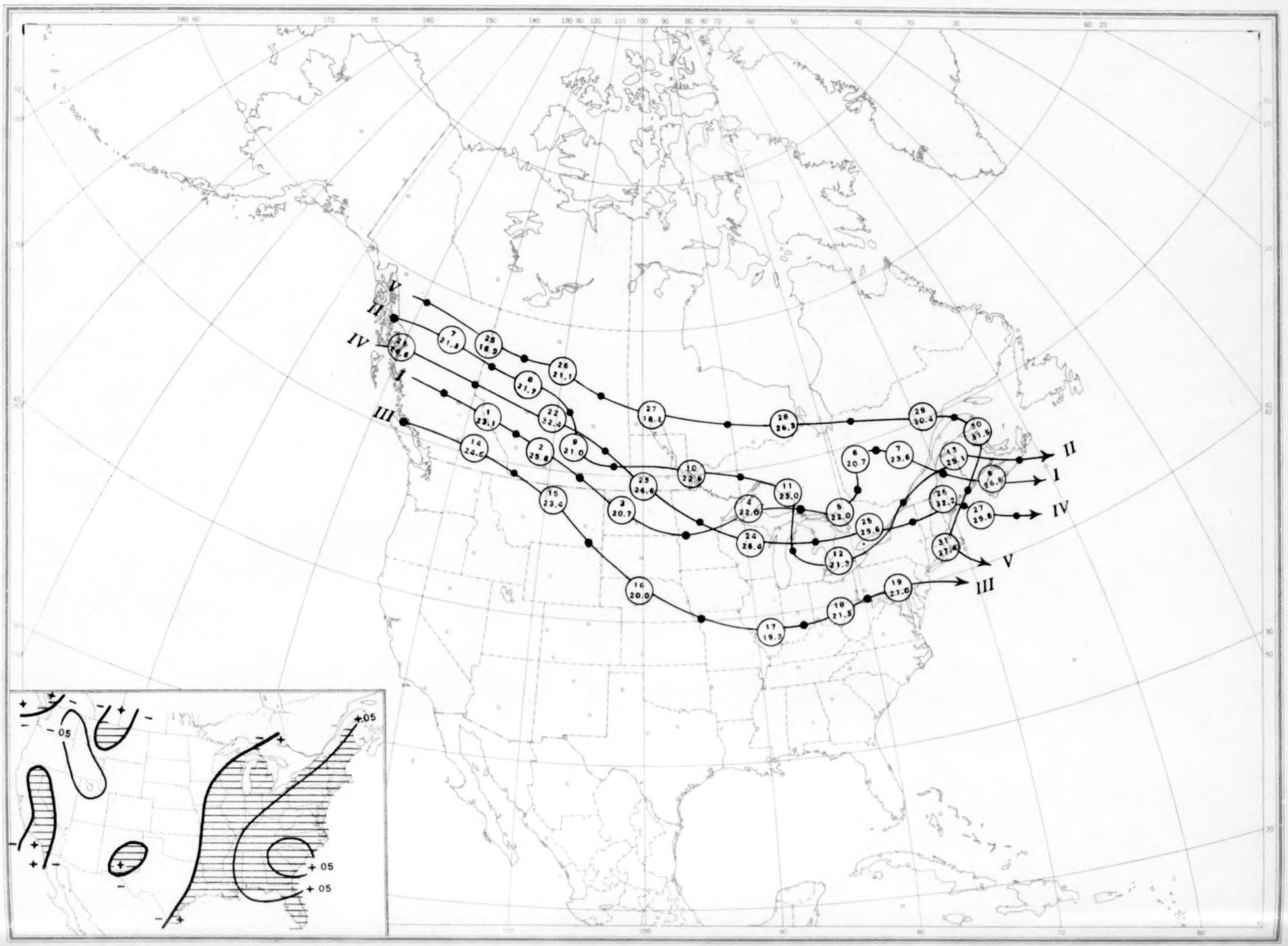


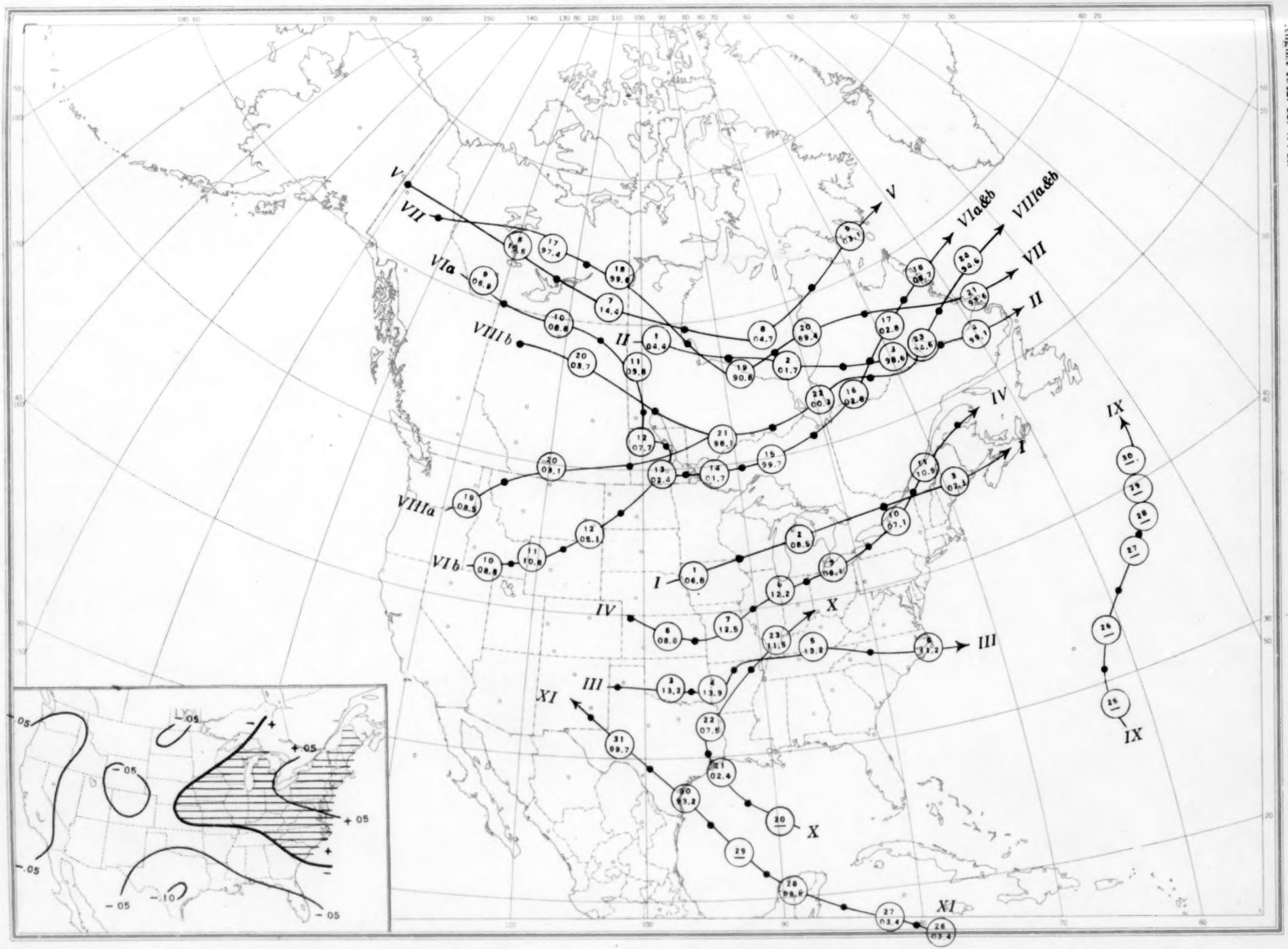
Chart II. Tracks of Centers of Anticyclones, August 1942. (Inset) **Departure of Monthly Mean Pressure from Normal**



Circle indicates position of anticyclone at 7:30 a. m. (75th meridian time), with barometric reading. Dot indicates position of anticyclone at 7:30 p. m. (75th meridian time).

Circle indicates position of anticyclone at 7:30 a. m. (75th meridian time), with barometric reading. Dot indicates position of anticyclone at 7:30 p. m. (75th meridian time).

Chart III. Tracks of Centers of Cyclones, August 1942. (Inset) Change in Mean Pressure from Preceding Month



Circle indicates position of cyclone at 7:30 a. m. (75th meridian time), with barometric reading. Dot indicates position of cyclone at 7:30 p. m. (75th meridian time).

Chart IV. Percentage of Clear Sky Between Sunrise and Sunset, August 1942

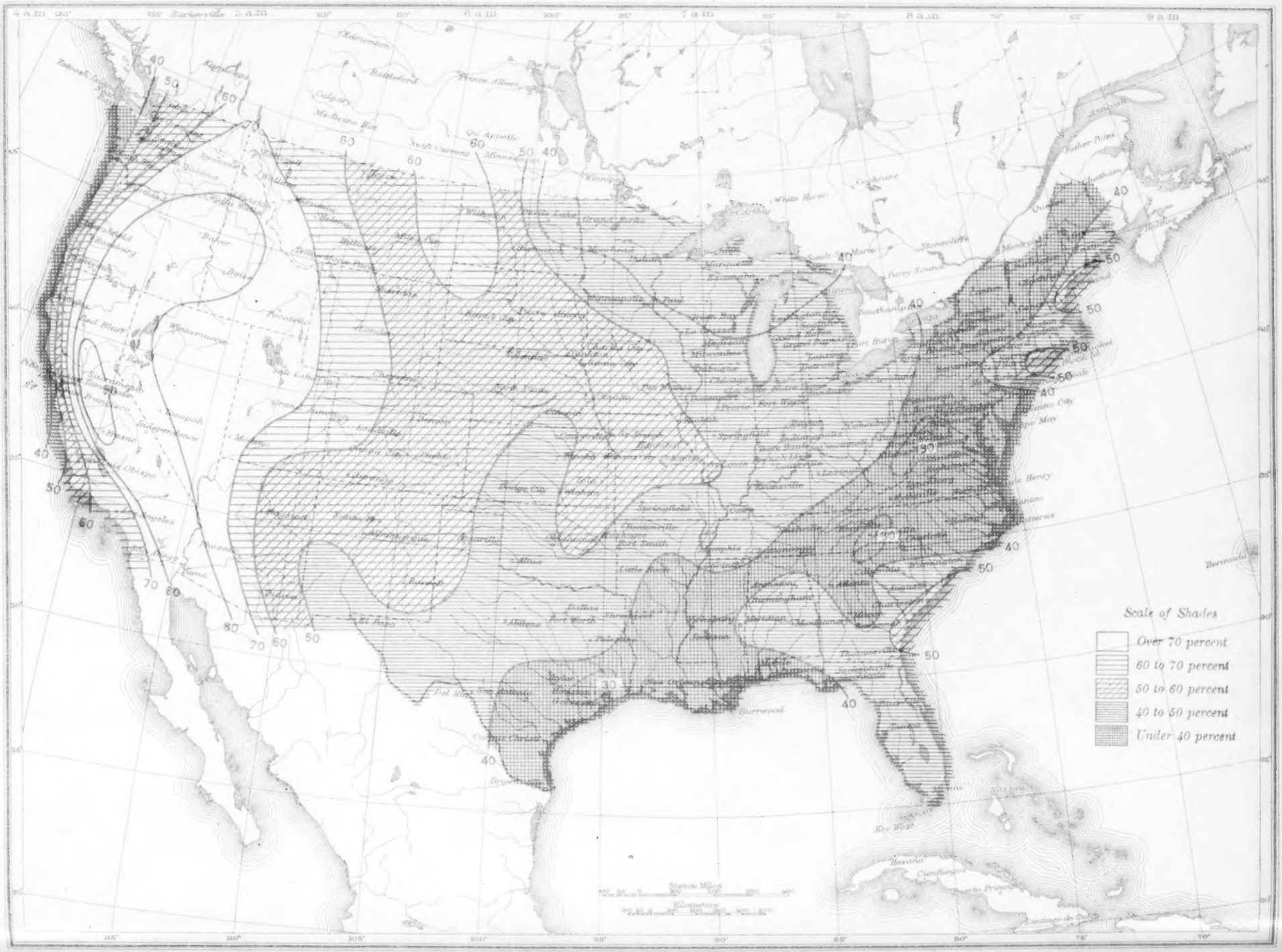


Chart V. Total Precipitation, Inches, August 1942. (Inset) **Departure of Precipitation from Normal**

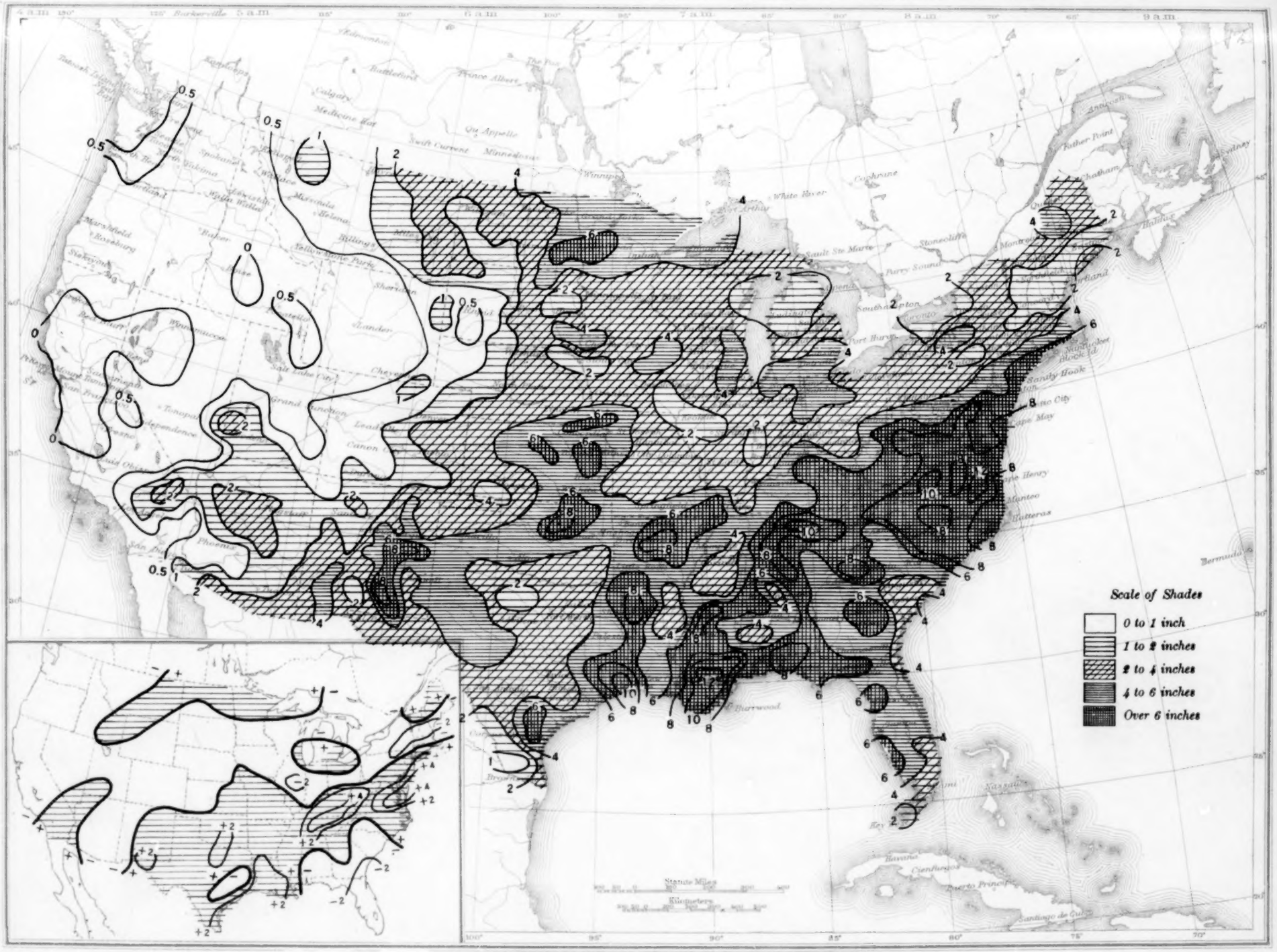


Chart VI. Isobars at Sea Level and Isotherms at Surface; Prevailing Winds, August 1942

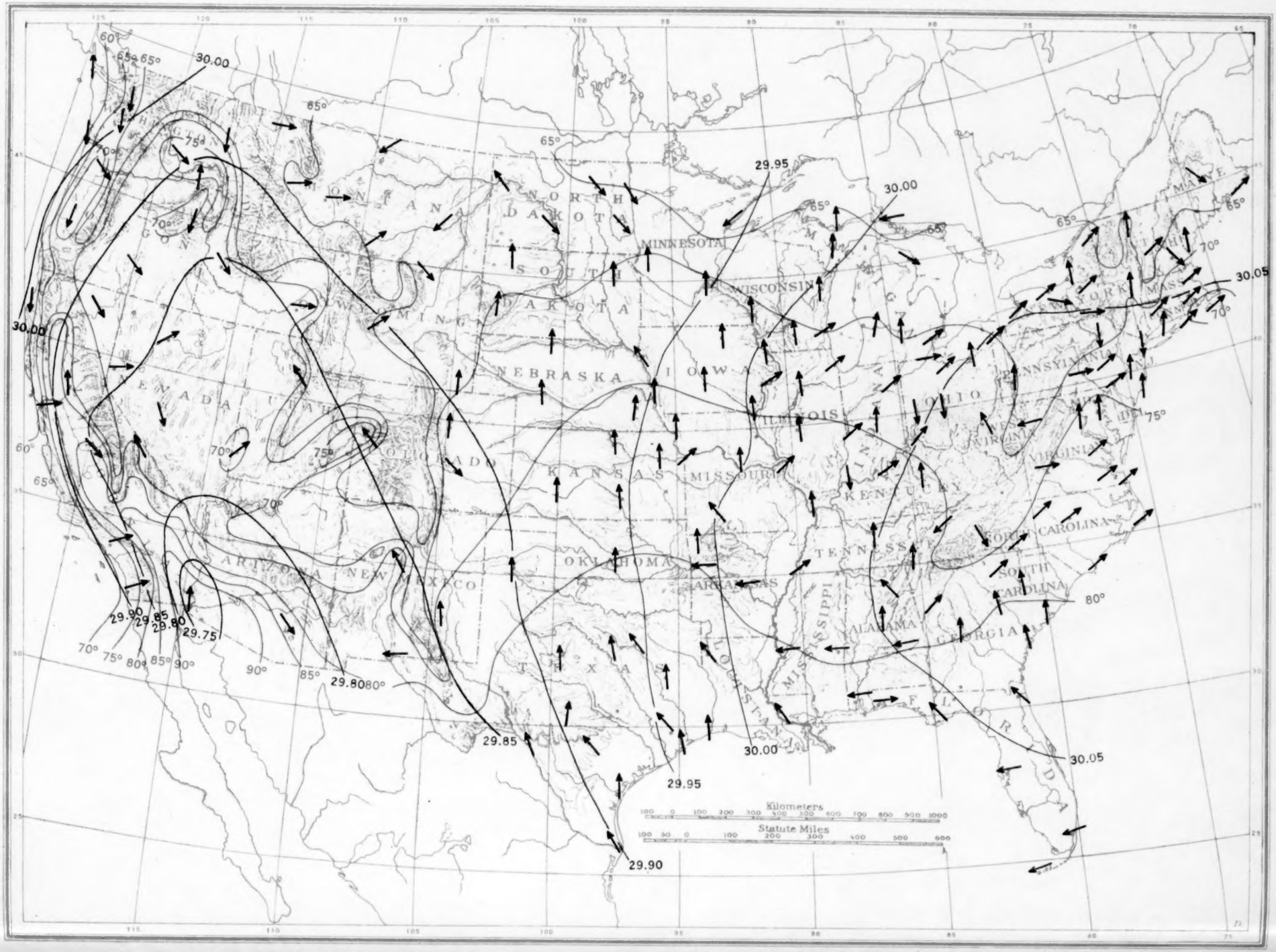


Chart VIII. Isobars (mb) for 1,524 Meters (5,000 ft.) and Isotherms (°C.) and Resultant Winds for 1,500 Meters (m. s. l.) August 1942

Chart VIII. Isobars (mb) for 1,524 Meters (5,000 ft.) and Isotherms (°C.) and Resultant Winds for 1,500 Meters (m. s. l.) August 1942

Isobars and isotherms based on radiosonde observations at 11:00 p. m. (E. S. T.) and winds based on pilot-balloon observations at 5:00 a. m. (E. S. T.).

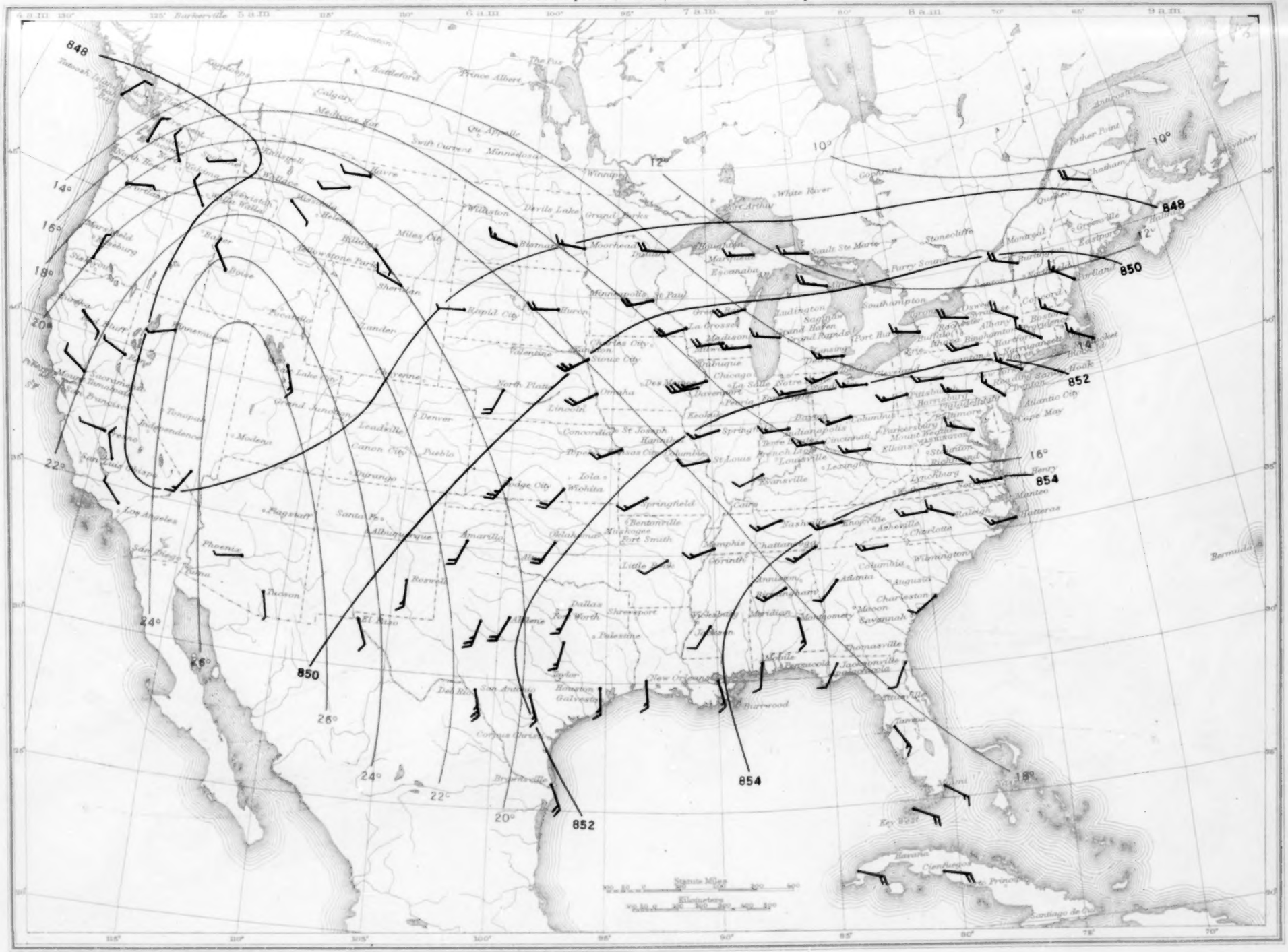


Chart IX. Isobars (mb) Isotherms (°C.) 11:00 p.m. (E.S.T) and Resultant Winds 5:00 a.m. (E.S.T.) for 3,000 Meters (m.s.l.) August 1942

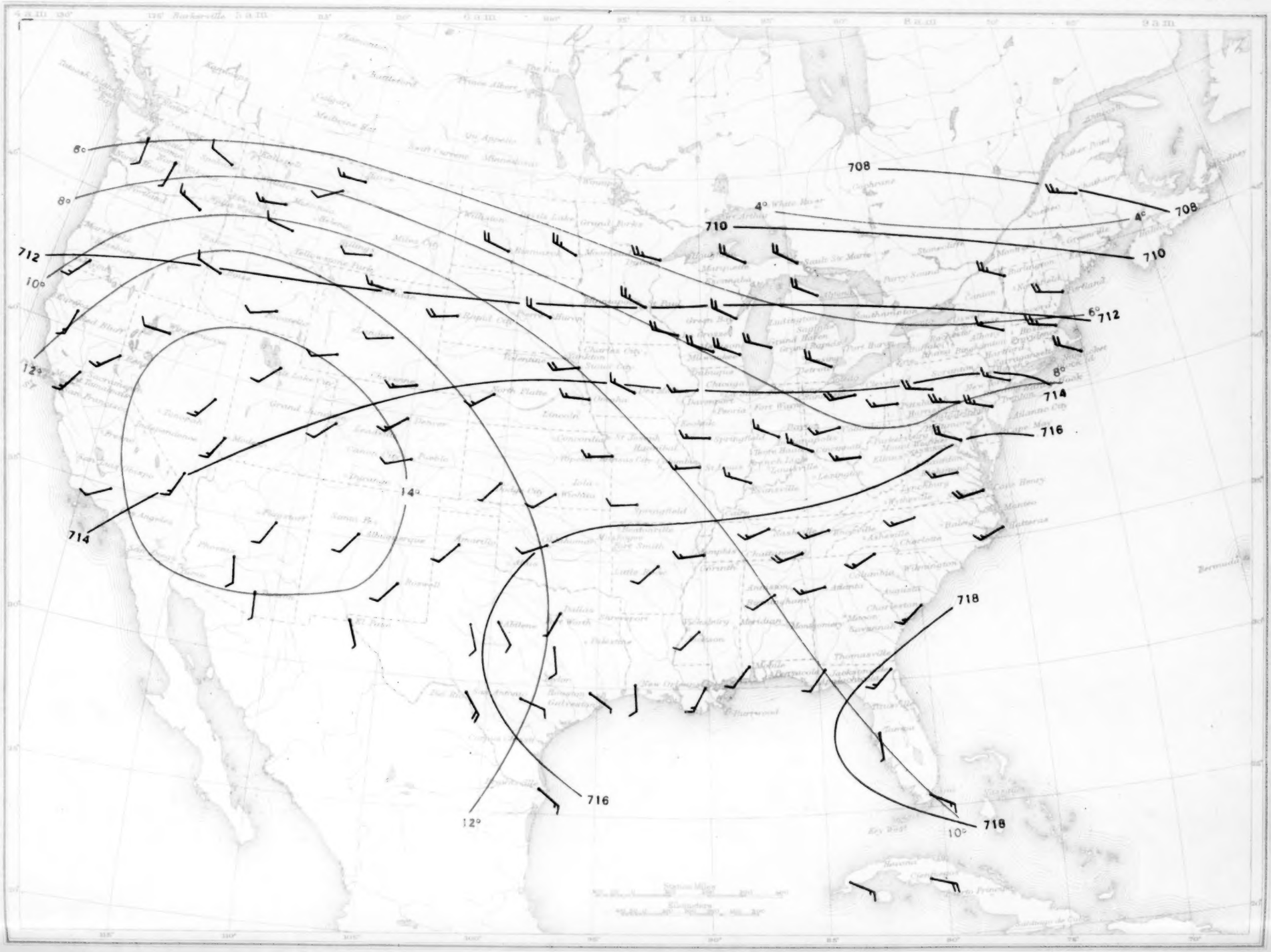


Chart X. Isobars (mb) Isotherms (°C.) 11:00 p.m. (E.S.T.) and Resultant Winds 5:00 p.m. (E.S.T.) for 5,000 Meters (m.s.l.) August 1942

Chart X. Isobars (mb) Isotherms (°C.) 11:00 p.m. (E.S.T.) and Resultant Winds 5:00 p.m. (E.S.T.) for 5,000 Meters (m.s.l.) August 1942

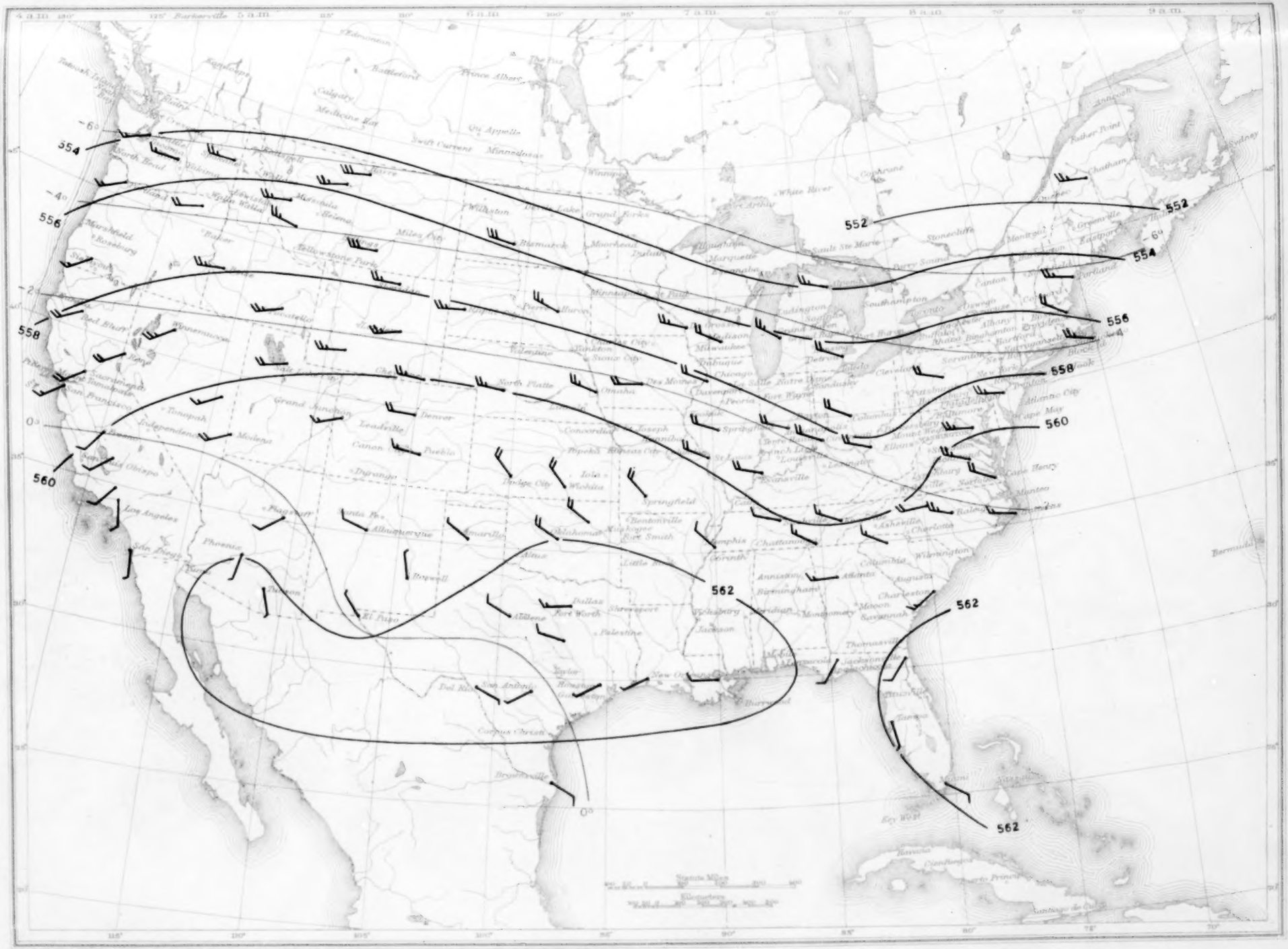
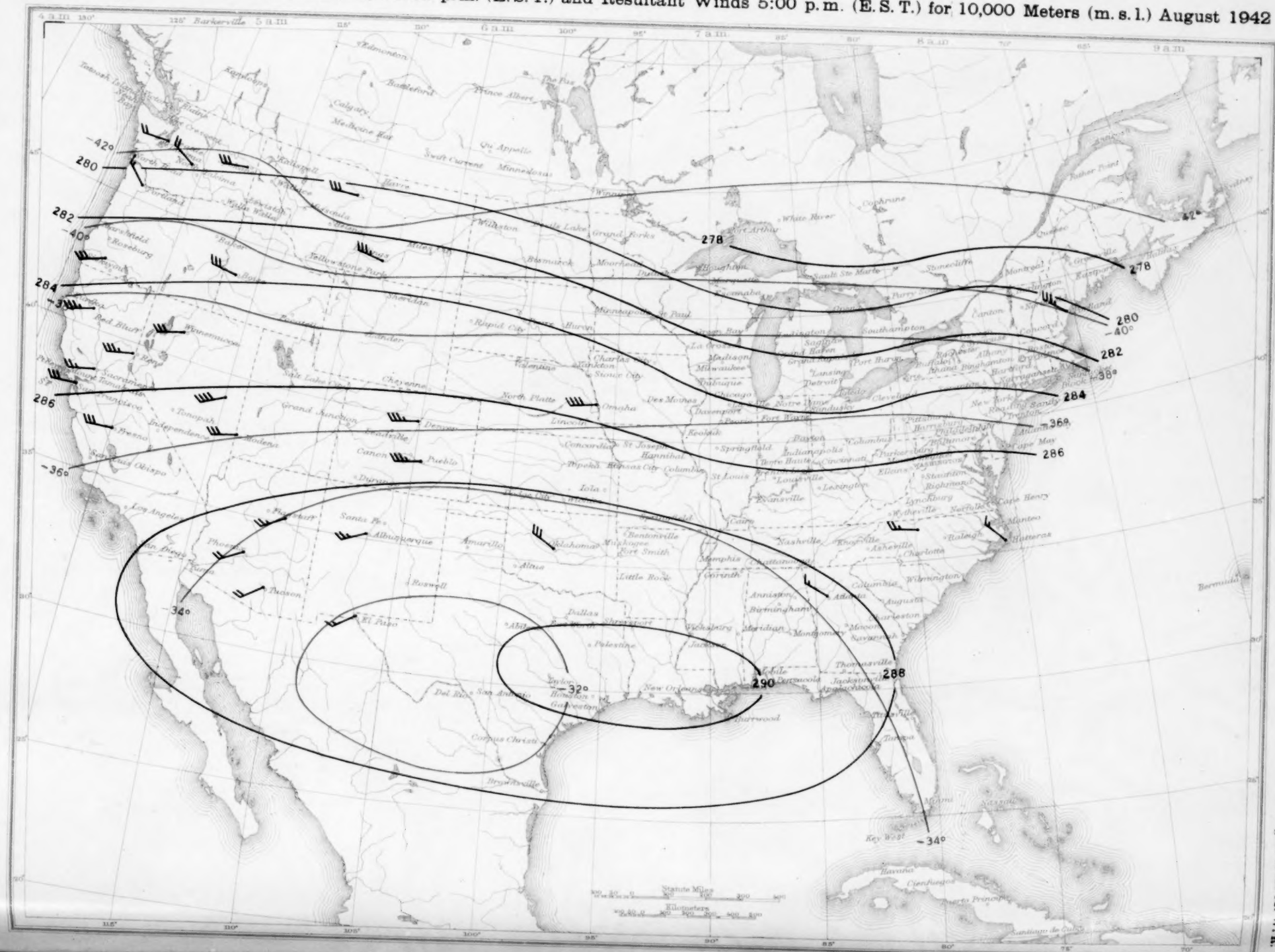



Chart XI. Isobars (mb) Isotherms (°C.) 11:00 p.m. (E.S.T.) and Resultant Winds 5:00 p.m. (E.S.T.) for 10,000 Meters (m.s.l.) August 1942